ENGINEERING NEWS-RECORD

MARCH 8, 1945

A Special Report On...

FLOATING DRYDOCKS OF THE U. S. NAVY

HERE'S HOW CONNECTICUT "Outlawed" PAVEMENT BREAKUPS

Connecticut's highway subdrainage program was speeded and simplified by use of long lengths of sturdy, flexible perforated pipe. Begun in 1940, the work continues, and pays dividends in firm, smooth pavements that require little maintenance.

★ ★ ★

Until 1940, pavement breakups were as "reg'lar as groundhog day" each spring on certain Connecticut highways. Then state engineers went into action with a thorough subdrainage program. Today that work is paying off in firm, smooth pavements, less maintenance work, reduced costs. A vital factor was—and is—perforated metal pipe that intercepts ground water in the trouble spots. They keep pavement foundations stable and firm.

You can "outlaw" costly breakups the same way with ARMCO Perforated Pipe. Installation is easy and fast, and costs are low—thanks to the long pipe lengths, fewer joints, light weight, and freedom from breakage. Once in the ground, ARMCO Perforated Pipe has the flexible strength needed to resist traffic weight and impact, vibration and disjointing. Perforations instead of open joints reduce the hazards of clogging.

Remember that good drainage is costly only when omitted. Write us for literature on Designed Subdrainage. Armco Drainage Products Association, 155 Curtis St., Middletown, Ohio.

ARMCO Perforated Pipe

ENGINEERING NEWS-RECORD

...oted to Buildings, Sewers, Waterworks, Bridges, Roads, Dams, Foundations, Earthwork, Flood Control, Public Works, Shipbuilding, Irrigation, Canals, Railroads

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WALDO G. BOWMAN, *Editor* ALBERT E. PAXTON, *Manager*

...ol. 134 MARCH 8, 1945 No. 10

...COMING NEXT

• The fourth in a series of reports on ...rmy Engineer activities in the Eu...opean Theater of Operations by Waldo Bowman, editor of *ENR*, is ...cheduled for the Mar. 22 issue. Mr. ...owman tells of the Herculean task ...mposed upon our engineers in con...erting a wrecked airfield in France ...nto a usable base for our C-47 and ...C-54 transport cargo planes.

• An $84,596,000 sewer construction program has been adopted by Chicago as one of its most urgently needed postwar undertakings. Consisting of 16 separate projects distributed throughout the city, this over-all program of stormwater and sanitary sewers will give much needed relief to existing inadequate drainage facilities. The area serviced covers 49,000 acres. What the program embraces and how it will be carried out will be a feature of the Mar. 22 issue.

• Comprehensive test, carried out over a three year period under actual traffic conditions, on portland cement concrete highways in Oregon indicate that expansion joints are unnecessary, providing dummy joints are properly spaced. Details of the test and findings of the Oregon highway engineers will be reported in the Mar. 22 issue.

LOOKING AHEAD

• The April 5 issue will feature a special section on *Construction Cost*—our annual round-up of statistical data covering cost indexes—general and special, labor rates, material prices, insurance rates and housing cost. In addition, there will be many pages of unit prices on jobs that were let in 1944. Several special articles relating to cost and estimating problems will be an added feature.

• BUILDING CODES—The Answer to Slenderness of South American Structures, scheduled for the April 19 issue, is the second in a series of articles by Arthur J. Boase, manager, Structural Bureau, Portland Cement Association. This article is based on first hand information of reinforced concrete design practices as observed by Mr. Boase while on tour of South American countries under sponsorship of *ENR*.

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DO YOU WANT AN INDEX?

Due to the paper shortage, no index for volume No. 133 (July-December, 1944) will be issued except to subscribers who ask for it. If you want a copy of the index please send in the coupon below.

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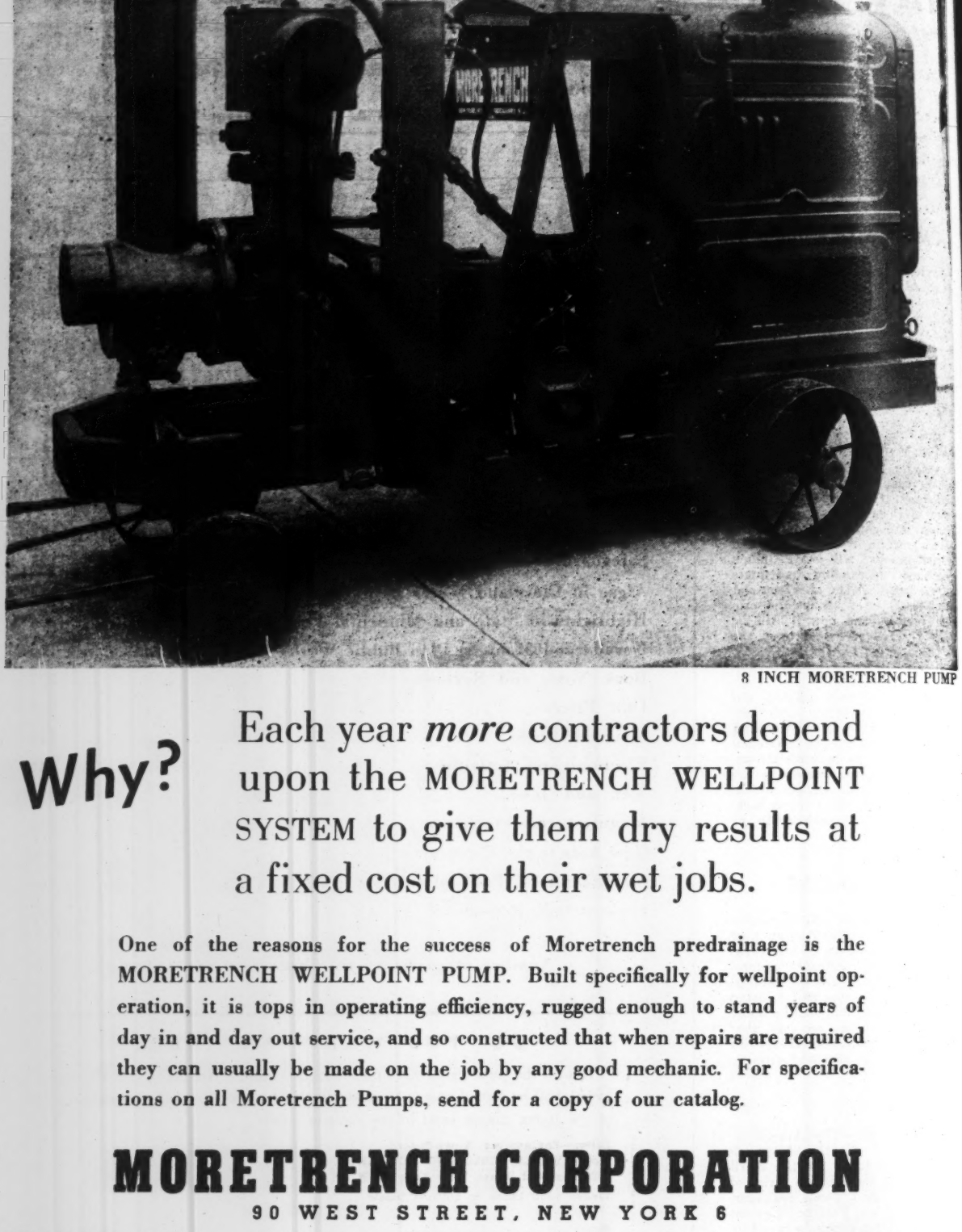

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New Construction in February

ENGINEERING construction volume continental United States totals $109,-000 for February. This volume is percent greater than in the preceding nth, but is 7 percent lower than in corresponding 1944 month, and the est February volume reported since 35.

Public construction for February tops st month by 45 percent as a result of 73 percent gain in federal work and responsible for the increase over Jan-ry. Private work, however, is 12 per-nt below a month ago, and state and unicipal construction is down 32 per-nt.

Both private and public construction e lower than in February 1944, private clining 1 percent, and public 9 per-nt. State and municipal volume is 34 rcent higher than in the month last ar, but federal work is down 13 per-nt compared with a year ago.

The February volume brings 1945 nstruction to $197,709,000 for the pening two months of the year, a total 8 percent under the $274,396,000 re-orted for the corresponding 1944 pe-iod. Private construction, $60,936,000, ps last year by 14 percent, but public nstruction, $136,773,000, is 38 percent wer. Federal volume, $112,116,000, is 6 percent lower than last year and is esponsible for the decrease in public volume as state and municipal construction is 64 percent above 1944.

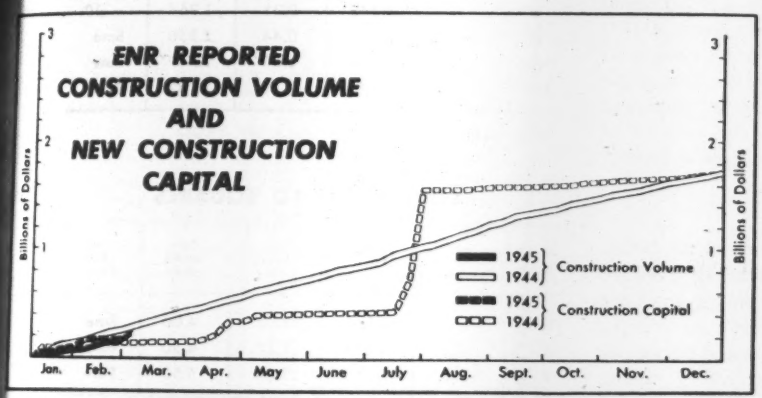
Geographically, four of the six sections of the nation report higher volumes in February than in the preceding month. Middle Atlantic construction gains 100 percent; South, 64 percent; Middle West, 34 percent; and West of Mississippi, 5 percent. New England is 60 percent below last month, and Far West is down 2 percent.

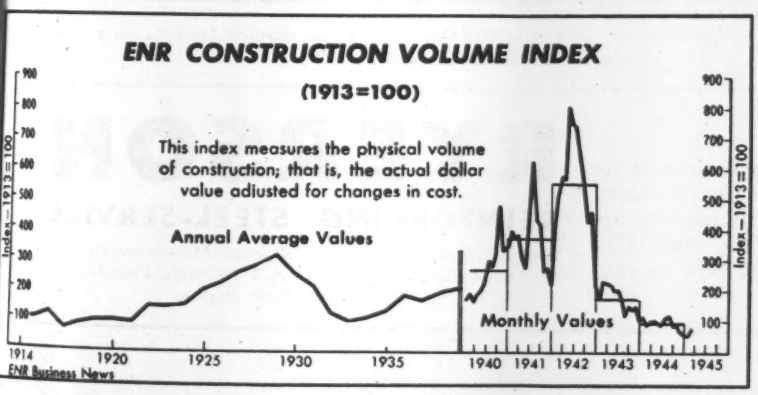
Compared with February 1944, the current month's regional totals are 47 percent higher in the South, and up 7 percent in the Far West. However, New England volume is 75 percent below the 1944 month; Middle Atlantic is down 36 percent; Middle West, 5 percent; and West of Mississippi, 8 percent.

New Capital

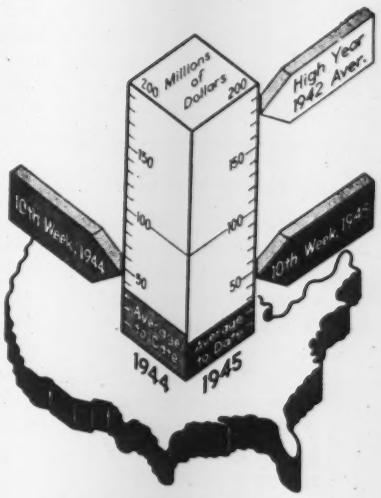
New capital for construction purposes for February totals $93,255,000, a volume 702 percent above that reported for the corresponding month last year. The February new construction financing brings the two-month 1945 volume to $196,472,000, a total 24 percent higher than the $158,801,000 reported for the period in 1944. The 1945 figure includes $109,740,000 in state and municipal bond sales, $9,595,000 in corporate securities, and $77,137,000 in federal.

(*See Volume Table, page* 85)




ENR CONSTRUCTION VOLUME INDEX
(1913=100)
This index measures the physical volume of construction; that is, the actual dollar value adjusted for changes in cost.
Annual Average Values
Monthly Values
Index—1913=100
1914 1920 1925 1930 1935 1940 1941 1942 1943 1944 1945
ENR Business News

CONSTRUCTION ACTIVITY



As Reported This Week to...
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only
(Thousands of Dollars)

	Week of Mar. 8 1945	Cumulative 1945 (10 wk.)	Cumulative 1944 (10 wk.)
Federal	$12,001	$155,270	$252,101
State & Municipal	3,622	29,832	26,735
Total Public	$15,623	$185,102	$277,836
Total Private	26,270	93,482	80,550
U. S. Total	$41,893	$278,584	$358,386

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Type of Work	Dollar Volume (Thousands) This Week	Cumulative 1945 (10 wk.	Cumulative 1944 (10 wk.)
Waterworks	$644	$7,433	$5,363
Sewerage	292	6,788	4,539
Bridges	509	6,918	1,884
Highways	2,751	13,095	19,558
Earthwork, Waterways	2,601	6,508	11,234
Buildings, Public	6,523	107,955	153,578
Industrial	24,748	66,962	31,317
Commercial	1,357	17,612	41,485
Unclassified	2,468	45,313	89,423

NOTE: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1945 (10 wk.)	Cumulative 1944 (10 wk.)
NON FEDERAL	$122,280	$83,029
Corporate Securities	9,595	51,176
State and Municipal	112,685	26,278
RFC Loans	.....	5,575
FEDERAL	$77,137	$90,832
Total Capital	$199,417	$173,861

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Mar. '45	304.50	146.37
Building Cost	Mar. '45	237.85	128.57
Volume	Feb. '45	78	34

Specify Hi-Bond Reinforcing Steel

It costs no more; yet it offers the strongest known bond between steel and concrete. Specify Hi-Bond reinforcing bars by name.

Available from Ryerson Stocks

Compare Hi-Bond

Laboratory tests indicate that the new Inland Hi-Bond reinforcing bar provides a bonding anchorage so great that the yield point of the bar is exceeded before an effective slip occurs. Hi-Bond bars eliminate wide cracks. Also, the use of hooks can be omitted in many instances. Hi-Bond is scientifically designed with heavy filleted, reverse double-helical ribs which afford a gripping surface many times that of standard deformed bars. This new bar opens the way for lighter, stronger reinforced concrete construction, with savings in both material and labor.

Reinforcing Bars rolled in wet cement show the tremendous difference in deformation pattern. This illustrates why Hi-Bond holds when other bars fail.

All Sizes on Hand

Ryerson carries all sizes of the new Hi-Bond bars in stock. All Hi-Bond bars are the same rounded, reverse ribbed shape. The larger sizes, therefore, are listed as "Equivalent to Squares" because they have the same cross section area as the standard square bars. They conform to the A.S.T.M. specification, Serial A-15-39; tensile strength 70,000 to 90,000 psi.; yield point 40,000 psi., minimum. Structural and hard grades in this design can be secured promptly. Our engineers will gladly work with you in applying Hi-Bond to best advantage. You are assured of full cooperation from estimates to final delivery.

Steel Prepared for You

Ryerson has complete facilities for cutting, bending or otherwise fabricating reinforcing steels to meet your exact requirements. In specifying bent bars, always give the dimension from outside to outside of the bar. Prices will be quoted either per pound or lump sum. Remember too, Ryerson carries all other types of construction steels and building accessories in stock. We will gladly prepare any of these items to suit your specific needs.

HI-BOND ROUNDS

Bar Mark	Size in Inches	Weight Per Ft. Lbs.	Area Square Inches	Perimeter Inches	Net Size Extras
*	¼	0.167	0.05	0.785	1.00
III	⅜	0.376	0.11	1.178	.40
IV	½	0.668	0.20	1.571	.20
V	⅝	1.043	0.31	1.964	.10
VI	¾	1.502	0.44	2.356	Base
VII	⅞	2.044	0.60	2.749	Base
VIII	1	2.670	0.79	3.142	Base

*Plain Round—Not deformed.

EQUIVALENT TO SQUARES

Bar Mark	Size in Inches	Weight Per Ft. Lbs.	Area Square Inches	Perimeter Inches	Net Size Extras
VIII □	1	3.400	1.00	4.00	Base
IX □	1⅛	4.303	1.27	4.50	Base
X □	1¼	5.313	1.56	5.00	Base

RAIL STEEL BARS, re-rolled from standard Tee rails, can also be furnished in the above sizes.

Fast Service

Convenient Ryerson plants provide immediate shipment from stock. All bars are plainly tagged for quick assembly on the job. Shipments are scheduled with the progress of the work. Call Ryerson whenever you need any type of construction steel.

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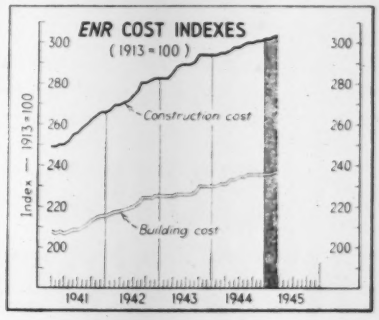
MARCH CONSTRUCTION BUSINESS REPORT

ENR CONSTRUCTION VOLUME AND NEW PRODUCTIVE CAPITAL

(,000 omitted)	February 1944	February 1945	% Change	Two Months 1944	Two Months 1945	% Change
Total U. S. Construction	$117,878	$109,516	−7.0	$274,396	$197,709	−28.0
Private Construction	28,875	28,574	−1.0	53,231	60,936	+14.0
Public Construction	89,003	80,942	−9.0	221,165	136,773	−38.0
Federal	81,576	70,995	−13.0	206,173	112,116	−46.0
Total New Productive Capital	$11,629	$93,255	+702.0	$158,801	$196,472	+24.0
Private Investment	10,129	93,255	+820.0	62,394	119,335	+91.0
Federal (non-federal work)	1,500	.....	.....	5,575	.....	.....
Federal (federal work)	.....	.....	.....	90,832	77,137	−15.0
ENR Construction Volume Index, 1913 = 100	86	78	−9.2	100*	71*	−29.0

* *Two-month average.*



CONSTRUCTION COSTS . . . WAGE RATES . . . MATERIAL PRICES

	March 1944	March 1945	% Change	Change February to March 1944 Feb.	1944 Mar.	1944 %	1945 Feb.	1945 Mar.	1945 %
ENR Construction Cost Index, 1913 = 100‡	295.34	304.50	+3.1	295.05	295.34	+0.1	303.70	304.50	+0.3
ENR Building Cost Index, 1913 = 100‡	232.32	237.85	+2.4	232.03	232.32	+0.1	237.71	237.85	+0.1

‡ *Does not reflect increased costs due to overtime, lower labor efficiency, delivery delays, etc.*

ENR 20-CITIES' AVERAGE

Common Labor	$0.870	$0.895	+2.9	$0.869	$0.870	+0.1	$0.891	$0.895	+0.4
Skilled Labor (Av. 3 trades)	1.623	1.643	+1.2	1.620	1.623	+0.2	1.641	1.643	+0.1
Bricklayers	1.715	1.744	+1.7	1.715	1.715	0	1.739	1.744	+0.3
Structural Ironworkers	1.680	1.698	+1.1	1.673	1.680	+0.4	1.698	1.698	0
Carpenters	1.473	1.487	+1.0	1.472	1.473	+0.1	1.487	1.487	0
Cement, per barrel	$2.62	$2.74	+4.6	$2.62	$2.62	0	$2.72	$2.74	+0.7
Reinforcing steel, cwt	2.79	2.79	0	2.79	2.79	0	2.79	2.79	0
Structural steel, base	2.10	2.10	0	2.10	2.10	0	2.10	2.10	0
Sand, per ton	1.23	1.25	+1.6	1.23	1.23	0	1.25	1.25	0
Lumber, 2x4 Fir, per M ft.	53.45	55.32	+3.5	53.45	53.45	0	55.32	55.32	0
Lumber, 2x4 Pine, per M ft.	49.88	53.44	+7.1	49.71	49.88	+0.3	53.44	53.44	0
Common brick, per M	16.20	18.32	+13.1	16.20	16.20	0	18.32	18.32	0
Ready-mixed concrete, c. y.	7.42	7.57	+2.0	7.42	7.42	0	7.48	7.57	+1.2
Struct. clay tile, 3x12x12	79.34	83.73	+5.5	79.34	79.34	0	83.00	83.73	+0.9
Paving asphalt, cars, ton	15.25	15.48	+1.5	15.25	15.25	0	15.48	15.48	0

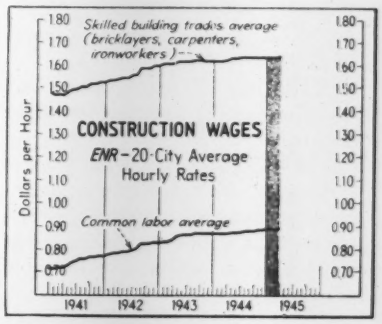
ENR INDEX NUMBERS

Base = 100	Construction Cost 1913	Construction Cost 1926	Building Cost 1913	Building Cost 1926	Volume '13	Volume '26
Mar., 1945	304.50	146.37	237.85	128.57	.....	.....
Feb., 1945	303.70	145.99	237.71	128.50	78	34
Jan., 1945	302.50	145.41	236.51	127.85	63	28
Dec., 1944	302.30	145.32	236.51	127.85	66	29
Nov., 1944	301.09	144.73	236.10	127.63	74	33
Oct., 1944	301.06	144.72	236.00	127.57	91	40
Sept., 1944	300.46	144.43	236.00	127.57	85	37
Aug., 1944	300.42	144.41	236.09	127.62	121	53
July, 1944	299.94	144.18	235.55	127.33	114	50
June, 1944	298.72	143.59	235.33	127.21	91	40
May, 1944	298.00	143.25	234.80	126.93	100	44
April, 1944	297.70	143.10	234.50	126.76	106	46
Mar., 1944	295.34	141.97	232.32	125.59	103	45
Feb., 1944	295.05	141.83	232.03	125.43	86	38
1944 (Av.)	298.64	143.59	234.73	126.89	96	42
1943 (Av.)	289.95	139.38	228.75	123.66	176	77
1942 (Av.)	276.31	132.82	222.39	120.22	553	243
1941 (Av.)	257.84	123.95	211.46	114.32	375	164

MATERIAL SHIPMENTS . . . . . BUILDING PERMITS

	February 1944	February 1945	% Change	Jan. 1945	% Change Jan.-Feb.
Steel (% operating capacity) A. I. S. I.	97.5	92.6	−5.0	92.3	+0.3

	January 1944	January 1945	% Change	Dec. 1944	Jan. 1945	% Change
Fabricated Structural Steel, tons, A. I. S. C.	35,163	42,031	+19.7	61,273	42,031	−31.3
Cement, thous. bbl., U. S. B. of M.	5,047	4,873	−3.3	4,595	4,873	+6.0
Building Permits, 215 cities, Dun & Bradstreet (,000 omitted)	$33,943	$44,767	+31.9	$39,433	$44,767	+13.5



COST OF LIVING INDEX . . . EMPLOYMENT

	January 1944	January 1945	% Change	Dec. 1944	% Change Dec.-Jan.
Cost of Living Index, N. I. C. B.	103.9	105.7	+1.7	105.7	0
Rent (Housing) Index, N. I. C. B.	90.8	91.0	+0.2	91.0	0
Total Employment (est.), thous., B. L. S.	38,965	37,852	−2.7	38,811	−2.4
Constr. Employment (est.), thous., B. L. S.	764	584	−23.5	590	−1.0

ENGINEERING CONSTRUCTION CONTRACTS — ENGINEERING NEWS-RECORD — FEBRUARY, 1945

Engineering News-Record *reports continental U. S. Construction projects of the following minimum costs—waterworks, excavation, drainage and irrigation,* $15,000 *other public works,* $25,000; *industrial buildings,* $40,000; *other buildings,* $150,000

Four weeks—Thousands of Dollars (000 Omitted)

	New England	Middle Atlantic	South	Middle West	West of Mississippi	Far West	United States February 1945	United States Two Months 1945	United States Two Months 1944	Canada
Public Works										
Waterworks	83	80	428	1,379	593	168	**2,731**	**6,189**	4,296	.....
Sewerage	.....	2,287	402	29	1,317	.....	**4,035**	**6,273**	3,598	.....
Bridges, Public	.....	.....	76	1,121	890	96	**2,183**	**3,329**	976	1,000
Earthwork, waterways	31	.....	913	204	251	1,100	**2,499**	**3,691**	10,262	.....
Streets and roads	.....	271	287	62	991	299	**1,910**	**10,057**	11,491	25
Buildings, public	334	11,697	12,779	4,790	13,882	10,208	**53,690**	**77,337**	124,138	150
Unclassified, public	144	1,525	4,937	327	2,631	4,330	**13,894**	**29,897**	66,404	43
Total public	**592**	**15,860**	**19,822**	**7,912**	**20,555**	**16,201**	**80,942**	**136,773**	**221,165**	**1,218**
Federal government (included in above classifications)	592	13,248	19,106	5,144	17,879	15,026	**70,995**	**112,116**	206,173	.....
Private										
Bridges, private	.....	.....	.....	.....	.....	.....	.....	**2,500**	870	.....
Industrial buildings	360	2,507	3,136	4,806	2,260	1,592	**14,661**	**39,584**	20,400	998
Commercial buildings	150	1,360	.....	852	550	8,105	**11,017**	**13,630**	29,013	350
Unclassified, private	65	60	976	53	1,132	610	**2,896**	**5,222**	2,948	53
Total private	**575**	**3,927**	**4,112**	**5,711**	**3,942**	**10,307**	**28,574**	**60,936**	**53,231**	**1,401**
Total Engineering Construction										
February, 1945—4 weeks	**1,167**	**19,787**	**23,934**	**13,623**	**24,497**	**26,508**	**109,516**	.....	.....	**2,619**
January, 1945—4 weeks	2,898	9,906	14,588	10,175	23,433	27,193	**88,193**	.....	.....	5,087
February, 1944—4 weeks	4,720	30,974	16,266	14,413	26,716	24,780	**117,878**	.....	.....	3,146
Two Months—1945	**4,065**	**29,693**	**38,522**	**23,798**	**47,930**	**53,701**	.....	**197,709**	.....	**7,706**
Two Months—1944	9,026	50,510	33,040	26,749	47,212	107,859	.....	.....	**274,396**	**4,550**

CONCRETE HIGHWAY NEWS

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BUILD GREATER SAFETY INTO YOUR POST-WAR ROADS

ATLAS DURAPLASTIC* Speeds Paving Operations

This air-entraining portland cement saved time and money at the end of each day.

In the construction of runways for two Army airports in New York State, Atlas Duraplastic cement proved some of its distinct advantages over regular portland cement. The contractor, L. G. Defelice, North Haven, Conn., says:

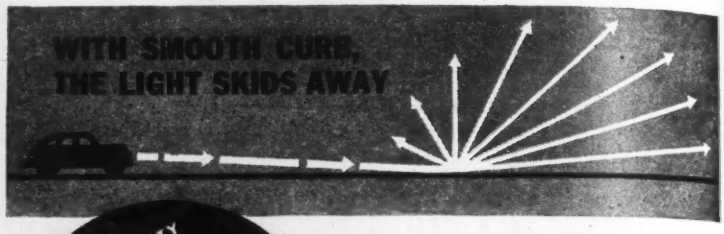
"The lack of segregation, and the increased plasticity found in Duraplastic Cement Concrete on these two projects, reduced considerably the spreading and finishing operations, in that only one pass of the screeding machine was necessary to produce a desirable surface.

"The cohesiveness of the mix and the negligible amount of bleeding, as compared to many regular portland cement concrete mixes, enabled our finishers to float, edge and joint the concrete surface immediately behind screeding operations. This saved a considerable amount of time and expense at the termination of each day's pour."

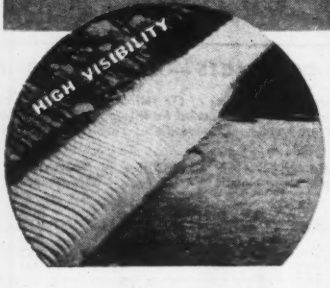
For further information about Atlas Duraplastic, write to Technical Service Bureau, Universal Atlas Cement Company.

*Trade Mark registered. U. A. C. Co.

ENR-CD-8



When car headlights strike *smooth* curb at a flat angle, nearly all the light is wasted—it is reflected forward and *away* from the driver. Visibility is low.



When car headlights strike the saw-tooth faces of White Reflecting Curb, the light, instead of being wasted, is conserved and utilized—it is reflected back to the driver, forming a bright guide to safety. Visibility is high.

Plan on building this extra factor of safety into your post-war highway projects. Write for a copy of the book, "A White Guide to Safety." It tells the complete story of this new scientific curb—its specifications, its installation, its safety value. Address Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • MARCH 8, 1945 • VOLUME 134 • NUMBER 10

FWA plans greater control over federal public works

Decentralization of the Federal Works Agency undertaken to facilitate ultimate supervision of all federal construction by that agency

A plan for gradual conversion of the Federal Works Agency into a federal Department of Public Works was outlined to the Senate Appropriations Committee on Feb. 22 by Maj. Gen. Philip B. Fleming, administrator of that agency. This plan was laid before the committee by General Fleming while discussing a reorganization of the FWA which soon will be undertaken to decentralize its activities and provide for greater coordination between the three constituent organizations, the Public Roads Administration, the Public Buildings Administration and the recently established Bureau of Community Facilities (*ENR* Jan. 18, vol. p. 89). The FWA now has 21,000 employees.

Centralized control planned

In his testimony General Fleming said: "The Federal Works Agency was created as of July 1, 1939, for the purpose of grouping and consolidating under one authority those agencies of the federal government dealing with public works not incidental to the normal work of other departments, and also those which administer federal grants or loans to state and local governments or other agencies for purposes of construction. This purpose has not been fully carried out. Large public-works construction programs are still being carried on by various other agencies of the federal government.

"The Veterans Administration recently has received funds greatly to expand its hospital construction program. To assist in this work we have agreed to detail to that administration 61 architects, engineers and technicians who for many years have been doing similar work under the Public Buildings Administration, which constructs marine hospitals and performs construction work for the U. S. Public Health Service. At the same time the Veterans Administration is expanding its organization in the same field."

General Fleming also said: "The United States of America, almost alone among the great nations, has no Department of Public Works responsible for all activities of this character. I trust that some day the Congress will see fit to carry out the original intent of the reorganization plan and actually group and consolidate under a Department of Public Works all those agencies dealing with public works and administering grants or loans to state and local governments or other agencies for purposes of construction."

New divisions set up

Under study for several months, the decentralization program for the FWA that soon will be put into effect calls for the establishment of nine geographical divisions, which in turn will be divided into districts. The divisions are to be made up as follows: No. 1, the New England States, New York and New Jersey with headquarters in New York City; No. 2, Pennsylvania, Maryland, Delaware, the Virginias and the District of Columbia, with headquarters in Washington, D. C.; No. 3, the Carolinas, Georgia, Florida, Tennessee, Alabama and Mississippi, with headquarters in Atlanta; No. 4, Ohio, Kentucky, Indiana, Michigan, Illinois and Wisconsin, with headquarters in Chicago; No. 5, Minnesota, Iowa, Missouri, the Dakotas, Nebraska and Kansas, with headquarters in Kansas City, Mo.; No. 6, Arkansas, Louisiana, Texas and

(*Continued on page* 91)

WPB reports building supply shortage

The increased rate of military procurement activity has resulted in a deterioration of the supply of some major materials, surveys by the War Production Board reveal. Shortages of manpower, fuel and transportation have caused manufacturing or distribution difficulties with a marked decline in the availability of certain items, while the stepped-up demand for military goods also has seriously affected the situation in regard to metals. In contrast, ample supplies of a few materials are available.

Briefly the supply picture for the principal building materials is as follows:

Lumber—This is extremely tight. The supply-requirements situation has shown no improvement in the last month and there is good reason to believe that it will get worse before improving.

Plywood—Softwood plywood is in very short supply, while a considerable volume of hardwood plywood is available in qualities suitable for construction work. However, although not under limitation order control and with purchases subject only to limitations of priority ratings on producers order files, hardwood plywood orders are currently subject to 60-day delivery.

Steel—In general, steel is considerably tighter during the past month, and worse than it has been for two years. Structural steel is tighter than at any time in the last three years, rolling mills are generally booked through April with flange sections booked through May. Deliveries of galvanized sheet and strip are not obtainable until third quarter. Low carbon narrow cold strip and all high strip deliveries extend into second half of 1945. Reinforcing bars, while still obtainable, are in a tighter supply position than two or three months ago. Mills are booked for reinforcing mesh through first quarter but there are some openings in schedules available for the second quarter. Thirteen-gage and finer are quite tight. Bar joists are subject to 60-day

(*Continued on page* 92)

Federal engineering agencies at odds over Pacific Coast river work

Engineers of the U. S. Bureau of Reclamation and the Corps of Engineers at odds over proposed river development work

An acrimonious dispute between ranking officials of Region II of the U. S. Bureau of Reclamation at Sacramento, Calif., and the Pacific Division of the Corps of Engineers at San Francisco concerning river development projects in Northern California, which has been smouldering beneath the surface for some time, has now become so serious as to have national implication.

Bones of contention in the controversy, which has come to involve a committee of the California legislature and sundry California and southern Oregon civic organizations, are:

1. A proposal to divert surplus waters of the Klamath River, which rises in southern Oregon and empties into the Pacific just south of the California-Oregon border, into the headwaters of the Sacramento Valley watershed, which, in turn, serves as a principal source of water for the Central Valley Project in California.

2. Proposed construction of a flood-control and hydro-electric project on the Sacramento River, at the so-called Table Mountain site, about 50 miles downstream from Shasta Dam, main unit of the Central Valley Project.

3. Proposed construction of a flood-control and hydro-electric project on the American River, in northern California, near the town of Folsom.

Old project revived

This controversy between the two federal agencies got into public print several weeks ago and subsequently was taken up by a special committee of the California Legislature as an aftermath to an announcement by Army Engineers that they had been requested by Congress to re-survey the proposed Klamath River Project. (The Army Engineers made a study of the Klamath project in the early Thirties, and their report was adopted by Congress in 1933.)

In announcing that a series of public hearings relative to the project would be held in California and Oregon during the latter part of February, Col. R. K. Moore, district engineer, San Francisco, stated the investigation was being made in "close cooperation" with the Bureau of Reclamation, the Federal Power Commission, and other federal agencies.

Director Charles E. Carey of the Reclamation Bureau in Sacramento promptly took issue with Col. Moore's statement. He flatly denied that the bureau was working with the Army engineers on the survey, or that his agency had prior knowledge of plans for the undertaking.

Director Carey asserted the bureau would not propose a study of such a diversion (Klamath) unless and until further irrigation development in the Sacramento and San Joaquin valleys discloses that there is an actual need for water in excess of supplies which can be made available by other conservation measures.

Diversion plans criticized

The Reclamation director likewise was highly critical of earlier suggestions of the Army Engineers for diverting Klamath River waters into the Central Valley system. In their 1933 report, the Engineers suggested either of two routes for the diversion (a) via a system of conduits and tunnels which would connect with the headwaters of the Pit River, a tributary of the Sacramento, or (b) diversion of waters of the Upper Trinity River, a main tributary of the Klamath, into the headwaters of the Sacramento, above Shasta Dam.

Director Carey stated that the bureau is prepared to undertake a survey of the proposed project only when and if there appears to be an actual need for it.

To this assertion Col. Edwin C. Kelton, division engineer of the Pacific Division replied that "for well over 100 years, the Corps of Engineers as a fact finding agency has made investigations of river problems for Congress. . . . When the Army Engineers are directed to investigate the water resources of any stream, such as the Klamath River, the law makes it mandatory that it be comprehensive in scope. . . ."

Meanwhile, the series of hearings conducted by the Army engineers in California and Oregon brought strong public protest against the proposed project. Similar meetings held by the joint legislative committee also developed vehement opposition to any plans for diverting Klamath River waters, although there were strong indications that some of the witnesses had political axes to grind.

At the same time the long-standing dispute between the Reclamation Bureau and the Army Engineers over the selection of a site for the proposed $18,000,000 Table Mountain Dam, appeared to have reached a climax with the Engineers emerging as the victors.

Reclamation officials had urged that when and if the dam is built, it be constructed at Table Mountain, about 50 miles below Shasta Dam. Army Engineers favored Iron Canyon, about six miles below Table Montain, as the site. In authorizing construction of the dam, Congress recently gave the Engineers authority to build the dam at Table Mountain or at an alternate site. They chose the Iron Canyon site, where preliminary tests are already under way.

Folsom project opposed

No less heated is the controversy that has arisen between the two government agencies over the proposal of Army Engineers that a large flood-control and hydro-electric development be made on the American River, in northern California, near Folsom. Congress has authorized construction of the project at an estimated cost of about $16,000,000. Reclamation Bureau officials, however, are actively opposing the project. They assert that the Army already is planning to spend between $50,000,000 and $60,000,000 on the development and that when the project is completed its main function will be to generate power, rather than to control floods.

Army Engineers emphatically deny such assertions, but admit that the base of the dam would be constructed in accordance with specifications that would permit enlarging the structure in the future.

. . .

N. Y. housing project to cost $10 million

Planned for postwar construction, the James Weldon Johnson public housing development in New York's East Harlem district will cost approximately $9,974,000, according to plans recently filed with the city's Department of Housing and Buildings in behalf of the New York City Housing Authority. About $3,349,000 of the total cost will be for land purchase. Funds for the development will be advanced by the state.

The project, which includes ten buildings 6 to 14 stories in height in the area bounded by E. 112th St. and E. 115th St. from Third Ave. to Park Ave., will provide 1,310 apartments for families of low income. Average rental is estimated at $26.50 per month, including electricity and gas.

Methods of surplus property disposal are recommended by the A. R. B. A.

Associated Equipment Distributors join in suggestions to Surplus Property Board for stabilizing conditions in construction industry

Recommendations on the methods of disposing of surplus construction equipment were made to the Surplus Property Board Feb. 28 by the American Road Builders' Association, represented by a delegation composed of James J. Skelly, president, representing the Contractors' Division, Paul B. Cochran, president, Manufacturers' Division, H. O. Penn, president, Distributors Division, and Charles M. Upham, engineer-director. The Associated Equipment Distributors were represented as acting for the distributors. The road builders' proposals are the first of their kind to be made to the board.

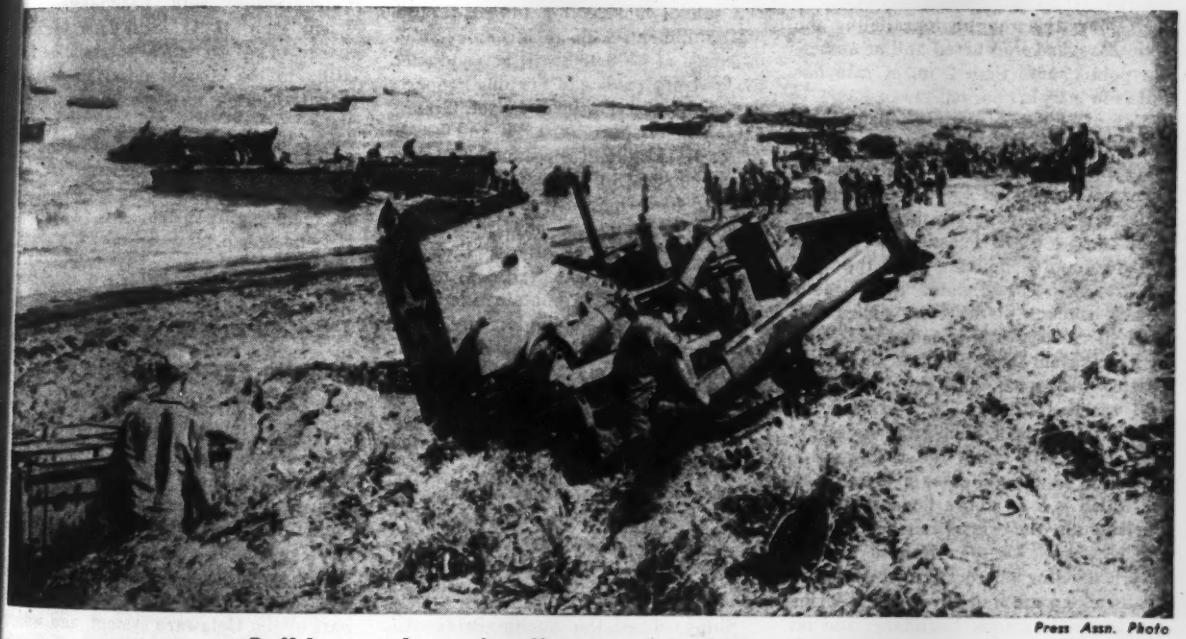
Charles M. Upham, delegation spokesman, said, "It is our hope that the policies we have outlined will be given consideration by the board to the end of stabilizing conditions within the construction industry during the transition period and providing maximum employment." He pointed out that disposal of surplus property in an orderly fashion through normal trade channels would go far toward maintaining full employment and conserving a prosperous national economy.

The recommendations covered the manner of disposing of new and used equipment and spare parts; advocated that the government receive a fair price for all surplus property sold no matter who was the purchaser; asked regulations on the amount of equipment that might be bought by federal, state and local government agencies; recommended that equipment now outside the United States be disposed of abroad; opposed rental of equipment by governmental agencies; and made a plea for protection of small business by inviting bids on small lots segregated by types, trade names and models. The delegation also asked that a Construction Equipment Advisory Committee be selected from the construction industry to advise the board on conditions within the industry.

The proposals of the American Road Builders' Association were the result of a series of conferences in Washington last week in which the aims and beliefs of representative manufacturers, distributors and contractors were aired. After the presentation of the recommendations to Chairman Gillette the committee was asked to make further studies of the construction industry.

Among the first orders issued by the Surplus Property Board is that relating to disposal of surplus property located in foreign countries. The Board has authorized the Army and Navy to dispose of its surpluses through the recently organized Office of Army-Navy Liquidation Commissioner. Property WILL NOT be reimported into the United States . . . except when it is being purchased by the original producer, or some other person or firm in the United States for reconditioning for *re-export;* or by an individual of the armed services for his personal use.

According to the regulation any surplus property and any waste, salvage or scrap located outside of the continental United States, its territories and possessions, may be disposed of by destruction or abandonment (a) when the destruction or abandonment is required by military necessity, safety, or considerations of health or security; or (b) whenever it is determined by an authorized representative of the disposal agency that the property has no commercial value, or that the cost of its care and handling disposition would exceed the estimated realization.



Press Assn. Photo

Bulldozers have leading part in Luzon invasion

Bulldozers continue to be in the forefront of invasion landings. The one in the foreground above has armor protection for the driver. Tractors and tractor operators are prime targets for Japanese snipers, hence the protection of the cab, which also is cooled by a 200 cfm. fan. Operations shown are at Binmaley on Lingayen Gulf as supplies were landed early in the Luzon campaign.

Ohio River has risen above the flood stage

Because of continued rainy weather, the flood now rising in the Ohio river will continue for several days, engineers of the U. S. Weather Bureau reported Tuesday. Although the maximum stages are expected to be below those of the 1936 and 1937 floods, considerable local damage and interruption to transportation is occurring.

One crest of 27.7 ft. was recorded at Pittsburgh Feb. 27 and another of 26.9 ft. on March 4. These levels compare with a flood stage of 25.0 ft. and a previous record high of 46.0 ft. on March 18, 1936. The flow early Monday passed Cincinnati with a crest of 62.2 ft. of 12.2 ft. above flood stage but far below the all-time record high stage of 80.0 ft. on Jan. 25, 1937. However, only twice since the 1937 flood has a height above 60 ft. been recorded. On March 6 the flood produced a stage of 67.0 ft. at the lower gage at Louisville, Ky., where flood stage is 55 ft. Later in the week a reading of more than 47 ft. or 10 ft. above flood stage was forecast at Evansville, Ind., while a reading about 11 ft. above flood stage is anticipated at Cairo, Ill., about March 10.

The floods on the Ohio are being caused primarily by extensive rain in the Ohio River basin, rather than by snow. The rains began in the middle of February and early this week were still in progress. Several storms with their long axis roughly paralleling the Ohio River have occurred and at numerout points more than 2 in. of rain has fallen in a 24-hr. period.

Rains on March 6 were causing new rises at nearly all points along the river. At Pittsburgh the stage was expected to exceed the flood level for the third time and at Cincinnati the stage had risen to 63.4 ft. on Tuesday morning.

Late reports indicate that the rain of March 6-7 will total nearly four inches in much of the Ohio Valley and that, as a result the flood, crests will be higher than those given in the earlier part of this report. The gage at Cincinnati reached 67.8 ft. on March 6. At Pittsburgh a crest of 35 ft. now is expected or 11 ft. below the 1936 record. Wheeling now anticipates a level of 45 ft., which is 9 ft. above flood stage. At Portsmouth the river reached 61 ft.

The U. S. Weather Bureau reports severe flooding on the Trinity River in Texas, along the Red River which forms the Texas-Oklahoma boundary, and on the Ouachita and White rivers in Arkansas. At Camden, Ark., on the Ouachita River, a stage of 39 ft. or a level of 2.5 ft. below the record stage was expected on March 7.

Deficiency Bill affords some construction money

The $2.4 billion dollar Deficiency Bill (H. R. 2374) passed by the House last week contains several appropriations for new construction work by various government agencies. These include: Federal Works Agency, $20,000,000 to be available for new community facilities projects after June 30, 1945; Public Roads Administration, $15,000,000 for access roads and $8,000,000 for strategic highway network; National Housing Agency, $84,373,000 for new construction and for reuse of existing war housing units by moving them to new locations; Bureau of Reclamation, $126,000 for additional construction at the Colorado River project in Texas; Bureau of Yards & docks, U. S. Navy, $114,300,000 for public works construction; Corps of Engineers, U. S. Army, $405,000 for widening channel in Sewaren, N. J. area; and Veterans Administration, $500,000 for maintenance, alteration and repair of hospitals and homes.

The House defeated an amendment which would have cut the NHA allotment by 50 percent. The measure now goes to the Senate, where action is not expected for several days.

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Sale of used equipment at Granite City, Ill.

A sale of construction and road building equipment, with an inventory value in excess of $400,000, will be conducted by Treasury's Office of Surplus Property at Granite City Engineer Depot, Granite City, Ill., on March 19, 20 and 21, F. A. Mapes, Regional Director in Chicago, has announced.

All dealers in construction and road building equipment in the United States are invited to attend. Bids will be accepted at the sale and dealers submitting high bids will obtain title immediately. Prospective bidders are urged to inspect the equipment at the site in advance of the sale. All equipment is in used condition. Inspection may be made on March 16 and 17. The depot may be reached by bus transportation from St. Louis, Mo.

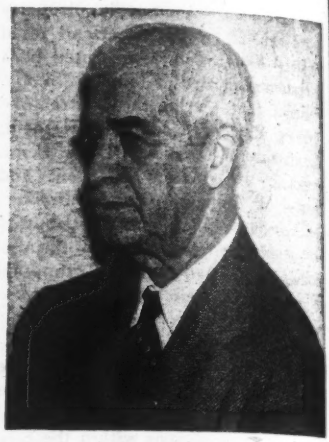
Additional information may be obtained by writing U. S. Treasury, Office of Surplus Property, 209 South La Salle Street, Chicago 4, Illinois.

Shipyards of the Pacific Bridge Co. in Alameda, Calif., will be consolidated with facilities of the General Engineering and Drydock Co. to form one of the largest private ship repair and conversion bases on the Pacific Coast.

A. H. Horton dies; 42 yrs. with Geological Survey

Albert H. Horton, 69, chief of the power resources division of the U. S. Geological Survey, died March 4 in Washington, D. C.

Following graduation from Cornell University in 1898 with a civil engineering degree, Mr. Horton spent five years



with the Deep Waterways Survey and the U. S. Lake Survey. The next 42 years, until his death, he worked with the Geological Survey, including many years as a district engineer in charge of surface water investigations in the Ohio River Basin. He later was in charge of similar investigations in the Middle Atlantic States with headquarters in Washington, D. C. Still later he had charge of all statistical information relating to the current development and potential power resources of the United States.

Late last year, Mr. Horton received a $300 cash "award of excellence" for one of his suggestions relating to recordings on steam-gaging instruments (*ENR* Jan. 4, 1945, vol. p. 8).

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Delaware Aqueduct work to be resumed this year

It was reported Feb. 27 that the New York City Board of Water Supply has obtained federal approval to resume construction work this summer on the Delaware Aqueduct, which, when completed, will add 540 mgd. of water to the city's supply of 935 mgd.

Approval has been given specifically for work on three projects that form a part of the Delaware system, and which will bring in 100 mgd. of the system's total capacity. The projects are the Merriman Dam and the Neversink and Rondout reservoirs. Work was discontinued on the projects in 1941.

Public works control

(Continued from page 87)

Oklahoma, with headquarters in Ft. Worth, Tex.; No. 7, Nevada, Arizona, California, with headquarters in San Francisco; No. 8, Montana, Idaho, Washington, Oregon and Alaska, with headquarters in Seattle; and No. 9, Wyoming, Colorado, Utah and New Mexico, with headquarters in Denver. Puerto Rico, the Virgin Islands and the Canal Zone are assigned to the Washington, D. C., central office.

Each of these three FWA agencies will have a division engineer in each area. These top representatives will serve as three-man committees to coordinate the various field activities and to determine the general policy of the FWA in the different divisions. The first chairman of each committee will be named by General Fleming, but after a committee is once in operation the chairmanship will be rotated.

PRA engineers get new titles

As a first step in reducing the number of division engineers to nine, the PRA recently named its 14 district engineers, including the representative in Alaska, acting division engineers. Later the number of division offices will be reduced to nine and the remaining personnel will be made a part of the district offices in a manner to be described later.

Two divisional engineers have been named by the PBA. These are John J. McNeely, head of the New York office, and Albert E. Sanderson in charge for PBA at Atlanta. The others are to be named in the next few months.

The Bureau of Community Facilities has named eight of its division engineers. These men are: L. A. Gillett, New York; Henry J. Sullivan, Washington, D. C.; Oliver T. Ray, Atlanta; R. C. Ashton, Chicago; C. W. Anderson, with offices now in St. Paul but later to be shifted to Kansas City; James W. Bradner, Jr., Ft. Worth; William H. Cheney, with offices now in Berkeley, Calif., and to be moved later to San Francisco; and L. R. Durkee, Seattle. Later, when conditions warrant, a division engineer will be appointed at Denver.

Much authority to district engineers

Supervision of construction will be done primarily by engineers heading the districts into which the divisions are to be divided. These men will be given much authority. This arrangement is expected to eliminate many time-consuming negotiations between the district and division offices and between the divisional offices and the Washington headquarters, while at the same time permitting more rapid action by men familiar with local conditions.

The number of district offices will vary considerably with the three constituent agencies. The PRA probably will assign a district engineer to each state, although the work in two neighboring small states, such as Vermont and New Hampshire, might be placed under one engineer. Under this plan, a few of the men now holding the title of acting division engineer will become district engineers, while other district positions will be filled by engineers now serving in other capacities. Ultimately, an increase in PRA personnel is expected as the Highway Act passed by the last Congress, making available 500 million dollars of federal aid for each of the first three postwar years (*ENR* Dec. 28, 1944, vol. p. 806), places a larger load on the PRA.

The Public Buildings Administration may not establish a large number of district offices in the immediate future, as this branch has little work at present in some areas.

The number of district offices to be created by the Bureau of Community Facilities will be determined in part by the amount of federal aid Congress makes available to local public works groups for the planning of postwar construction. As reported in *Engineering News-Record* last week, Congress may provide as much as $60,000,000. This money will be distributed by the Bureau of Community Facilities, and the work caused by that distribution, plus the war-time functions of the bureau, may result in that agency establishing one or more district offices in most states.

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WPB allocates pumps for possible flood areas

To meet anticipated demand for dewatering pumps in states where spring flood conditions are expected, the War Production Board has ordered producers to set aside 75 percent of their authorized non-military production and inventories of such equipment for distribution in twelve states.

The order is effective immediately and will continue through April 1. States in which it will be effective are Illinois, Indiana, Missouri, Ohio, Kentucky, West Virginia, Pennsylvania, New York, New Hampshire, Vermont, Massachusetts and Connecticut. Under the order, self-priming centrifugal pumps of sizes 1½ in. to 6 in. are included.

Of the remaining 25 percent of the non-military authorized production, 15 percent must be set aside and not sold outside the flood-threatened states without WPB authorization.

JOBS OF THE WEEK

NYLON SALT PLANT, Orange, Tex.

E. I. duPont deNemours & Co., Wilmington, Del., will construct nylon salt plant by force account. The estimated cost is $20,000,000.

REPAIR SHOPS, Brainerd, Minn.

Northern Pacific Railway Co., B. Blum, chief engineer, St. Paul, Minn., awarded a contract for constructing superstructures for 180x575-ft. main repair shop and a 278x100-ft. material warehouse to Al Johnson Construction Co., Minneapolis, Minn. The estimated cost is $1,500,000.

TUNNEL and RIVER CHANNEL IMPROVEMENTS, Boulder City, Nev.

Bureau of Reclamation, Department of the Interior, Boulder City, Nev., awarded a contract for the construction of tunnel and river channel improvements, at Boulder Dam, Colorado River, to Guy F. Atkinson Co., Long Beach, Calif., at $2,586,450.

FACTORY, Dallas, Tex.

Standard Brands Inc., Dallas, Tex., awarded a contract for the construction of a 2-story, basement factory to Inge Construction Co., Inc., Dallas, Tex. The estimated cost is $2,000,000. Jemison & Merrell, Dallas are the architects.

RESIDENCES, Chicago, Ill.

Chatham Village Construction Co., Chicago, Ill., will build 116 single family residences, by its own forces. The estimated cost is $800,000. Carl J. Kastrup, Forest Park, is the architect.

DWELLINGS, Hoonah, Alaska.

Public Housing Authority, Seattle, Wash., awarded a contract for the construction of 80 single-family dwelling units to Alaska Construction Co., Juneau, at $551,000. H. B. Foss, Juneau, is the architect.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 225.

OBITUARY

Franklin C. Snow, 62, dean of the school of engineering of the Georgia School of Technology, died in Atlanta, March 1. He was graduated from Ohio State College in 1906 and began his teaching career at Montana State College. He went to Georgia Tech 26 years ago.

J. C. Kennedy, 79, former Union County, Ohio, surveyor and Marysville city civil engineer, died Feb. 26 in that city.

Hall B. Fletcher, 85, former supervisor of highways for southern Ohio, died Feb. 26 in Miami Beach, Fla.

Charles H. Breyman, 78, retired member of the G. H. Breyman and Brothers, Toledo, Ohio, dredging contractors, died March 2 in Hollywood, Calif. He was graduated in 1889 as a civil engineer from Columbia University. From 1890 to 1897 he was assistant city engineer of Toledo, and during the following ten years, he had charge of the city sewers, and was responsible for the construction of most of the present system. In 1907 he became a member of the Breyman-O'Neil Contracting Co., with which he was affiliated until 1917, when he returned to the firm of G. H. Breyman and Brothers.

Capt. Hugh P. Oram, 61, former assistant engineer commissioner and director of inspection for the District of Columbia, died Feb. 27 at St. Petersburg, Fla., where he had lived since his retirement in 1940. Captain Oram began his career in government service in the Geological Survey in 1902. He entered the Army Engineer Corps in 1916, and was assigned to the District of Columbia as assistant engineer commissioner in 1929. In 1932 he resigned from the Army to become director of inspection for the district, and held the post until his retirement because of ill health.

Frank R. Morse, 80, who retired two years ago from the C. W. & P. Construction Co., Akron, Ohio, and who had been in the construction business in that city since 1917, died Feb. 25.

John H. Ryckman, assistant engineer of waterworks design in the Department of Public Works, Chicago, Ill., since 1926, died Jan. 30 in that city. An engineering graduate of the University of Toronto, Mr. Ryckman first joined the city service in 1919 as designing engineer. He was responsible for the design of several of Chicago's large pumping stations.

Preston Geddes Peterson, 61, member of the Utah State Road Commission for 18 years and chairman of the commission from 1922 to 1926, died Feb. 22 in Provo. Mr. Peterson served on the first Utah water storage commission. He was a member of the executive committee of the American Association of State Highway Officials and a director of the American Road Builders' Association.

Whelock W. Whitney, Shorewood, Wis., died Feb. 26 at Escanaba, Mich., where he was area engineer for the Army ore-dock project. Previously, he was a contractor in the Milwaukee area.

Lieut. Col. Harry F. Cameron, 71, former Army district engineer at Philadelphia, Pa., died Feb. 23 at Atlantic City, N. J. He was a major in the Army Engineers in the first World War and remained in the regular Army until his retirement in 1934. His first assignment to Philadelphia was in 1920 as assistant engineer. Later he served as district engineer in California.

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Building supplies tight

(*Continued from page* 87)

delay in deliveries in ordinary cases.

Structural Insulation Board—Requirements exceed production with unfilled orders increasing. Increasing export demand may delay future deliveries.

Laminated Fiber Board—Requirements exceed production and orders are subject to 60-day delay, while export requirements may increase delay. Retail stocks are low but production capacity is well above demand.

Virtified Paving Brick—In general, stocks are ample.

Glazed Brick—Plentiful supply everywhere.

Brick—Supply ample to meet most demands, but a few local shortages exist.

Clay Sewer Pipe—Supply is ample in all sections.

Structural Clay Tile—Capacity far exceeds demand and it is in plentiful supply throughout the United States.

Metal Lath—Sufficient is available for all essential work.

Asphalt—Currently in good supply and may be used for paving and road work generally. There may be some regional shortages due to transportation difficulties, but no restrictions on its use are now in effect except those in Amendment 1 to PAW Directive 72 prohibiting use of certain types for road oil and dust palliatives in California, Oregon, Washington, Nevada and Arizona.

Tile—Unglazed hollow facing tile and glazed hollow facing tile are readily available throughout the country.

Cement-Asbestos Pipe—Reasonable quantities may be obtained immediately without priority assistance.

Cement-Asbestos Shingles—White shingles are difficult to obtain; gray shingles are more easily obtainable. Deliveries are averaging 60 to 90 days after order.

Cement-Asbestos Building Board—Supply ample on two weeks' delivery time.

Asphalt Roofing—Although all civilian, military and export requirements are being met, a 60-day backlog exists in civilian construction, maintenance and repair stocks. Raw materials are in adequate supply, but manpower shortage is a production difficulty.

Concrete Masonry Products—In general, supplies are ample. Capacity for manufacture is adequate under normal conditions.

Concrete Pipe—Plain and reinforced concrete pipe and concrete drain tile are available in most territories within short-haul distances.

Concrete Floor and Wall Tile—A 6- to-8 months backlog of orders exists.

Portland Cement—This is available in every section of the country.

MEETINGS

Regional and Local

NORTH WEST GOOD ROADS ASSOCIATION OF MINNESOTA, annual meeting Nicollet Hotel, Minneapolis, Minn., March 16.

CANADIAN SECTION, AMERICAN WATER WORKS ASSOCIATION, Toronto, Canada, March 19-21.

MONTANA SECTION, AMERICAN WATER WORKS ASSOCIATION, Lewiston, Mont., April 13-14.

NEW ENGLAND SEWAGE WORKS ASSOCIATION, spring meeting, Hotel Statler, Boston, Mass., May 2.

Cancellations

1945 annual convention of the Nebraska Engineering Society.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION, St. Louis, Mo., June 21-24.

The Week *In Engineering and Construction*

(*Continued on page* 142)

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

Buildings Should Be Rigid

Sir: The article by Mr. Weitzman, "Bracing for Industrial Buildings," (*ENR* Nov. 16, 1944, vol. p. 627) and Mr. Ashton's reference to it (*ENR* Dec. 14, 1944, vol. p. 741) merit a great deal more attention.

Bracing, as a rule, is subject to wind stress, as well as stress due to temperature variation. Sometimes it is also subject to stress due to loads other than these. Some engineers seem to feel that if a structure is flexible and vibrates with wind pressure or shows signs of distortion as a result of temperature variations, it is a normal physical reaction, and is OK so long as the structure shows no outer signs of distress. I am one who does not agree with this premise, as I believe these conditions eventually may lead to costly operating and maintenance expense, and are controllable and also avoidable, in most cases, at a negligible increase in cost.

In long span buildings considerable time is usually spent in designing arch and truss members so the web and chord centers intersect at a point. With the truss designed, the bracing becomes a step-child, and this same important, basic principle is ignored. As a consequence, too frequently a horizontal bracing (truss) system is designed with the web and chord members in three different planes.

Add to the above the usual permissible fabrication variations in the best of structural work, and an otherwise real high-class job becomes an uncertain factor, especially where the bracing truss system is an all-bolted or riveted job. If this building transfers substantial load into the bracing system, it will lack rigidity.

Mr. Ashton calls attention to a long building that was vibrated by inserting a 2x4 between the expansion joint, and offers a "stiff bracing system concentrated near the center of temperature movement" as the answer. This is the answer if only temperature variation is involved and the building is not a very long one. In such a long building some of the purlins will need to be designed to carry the temperature variations and the ends of columns or arches, particularly near the ends of the building, would still be subject to temperature torsional stress.

In long buildings considerable forces accumulate rapidly in the length of the building where substantial temperature changes occur, and these forces should be considered and controlled, but they cannot be prevented except by expansion joints. In wide span buildings temperature variation in the roof-carrying arch or truss is important and should be considered in the design; but, if the building is also relatively long, the ends of the building will be the critical points if provision is not made to absorb the expansion or contraction.

It can be argued that after a building is erected the temperature in the building is fairly constant in cold climates, but it can be said that if heat is left off for any reason, just once, the damage is done. In buildings with large doors, like hangars, temperature itself may be the cause of doors' jamming, with the doors not being at fault.

Of course, other reasons and causes may exist for a building not being rigid, but the subject is too broad for treatment in a letter. However, I maintain there is no valid excuse for a building not being practically rigid, and surely no valid excuse for a building not functioning normally as intended by the design regardless of loads or temperature.

L. Davidson
President and Chief Engineer
Arch Roof Construction Co., Inc.
New York 18, N. Y.

Concrete Floors

Sir: The article, "Reconditioning Concrete Floors to Carry Heavy Warehouse Traffic", *Engineering News-Record*, Jan. 25, 1945, Vol. p. 116, overlooks the fundamental principle that provision for durability must be built into a concrete floor during installation—it cannot be brushed on the surface later. That these warehouse floors subject to heavy traffic have had to be replaced on so large a scale, emphasizes again the high cost of plain concrete floor finish where traffic is involved.

In the report of the National Bureau of Standards, Research Paper No. 1252, published in Volume 23 of the Journal of Research, Nov. 1939, are what is generally regarded as conclusive facts as to the relative durability of different types of concrete floor finish. The floor into which was incorporated 60 lb. of graded metallic aggregate per 100 sq. ft. was found to be the most resistant to abrasion of all the finishes investigated, and is a floor which could have been installed in these warehouses at little cost in the beginning. It seems reasonable to believe that the savings in repairs, labor and inconvenience incurred subsequently would have exceeded that small initial investment.

In the same report, references to sodium silicate and magnesiumzinc fluosilicate surface treatments are:

"The tests show that in no case did surface treatments compensate for length of damp curing.

"Liquid surface treatments, such as solutions of magnesium fluosilicate or of water glass, are effective in improving the wear resistance of concrete that has not been damp cured."

In replacing the trucking aisles with concrete finish, consideration can profitably be given to armoring these with a qualified metallic aggregate finish of weight adequate to carry the traffic involved; for floors in plants with heavy industrial traffic the use of up to 120 lb. of metal per 100 sq. ft. is common practice.

E. L. McFalls
Vice President and General Sales Manager
The Master Builders Company
Cleveland, Ohio

German "Meter Beam"

In describing German construction materials captured in Brittany, Waldo G. Bowman, editor of *Engineering News-Record* (*ENR* Feb. 22, vol. p. 265), tells of the so-called "meter beam", a rolled girder used for bridging. Depth of the beam was given as 39 in. and weight as 213 lb. per ft.

In a letter, which was delayed in transit from abroad, Mr. Bowman corrects these figures and states that the beam is 41 in. deep and weighs 256 lb. per ft.—*The Editors.*

EDITORIALS

VOLUME 134 NUMBER 10

March 8, 1945

Floating Drydocks

ONE of the outstanding engineering contributions to the present war is the design and construction of floating drydocks for the U. S. Navy. For security reasons the whole operation has been shrouded in secrecy for many months, but now that the naval strategy that these floating drydocks made possible is a matter of common knowledge, some information concerning that work has been released by the Navy although many of the design details still are confidential. While the floatdrydock construction program was in full swing, the Navy borrowed Hal W. Hunt of the *Engineering News-Record* staff to make a permanent record of these operations for the Bureau of Yards and Docks. He visited all the yards where the work was under way and prepared a detailed account of the methods used by each of the several contractors. The articles beginning in this issue are based on that study.

An Opening Wedge

STRONGER JUSTIFICATION than now exists would seem to be necessary for the appropriation of $75,000,000 of federal funds to aid states and local governments in planning postwar public works. When this appropriation was recommended in 1944, the end of the war with Germany seemed imminent and there was some question of the preparedness of local governments to resume postwar construction of public works. Months of time have elapsed, however, during which those local government units that had the *will* to do have made substantial progress in planning, designing and otherwise implementing their postwar construction plans. Cognizance of this fact was shown by the House when, on Feb. 8, it reduced the appropriation from $75,000,000 to $5,000,000. Now the matter is before the Senate Appropriations Committee. It is our hope that this body will go even further than the House and eliminate every penny of federal planning aid. At this late date, authorization of such aid will favor those who have delayed their planning waiting for a federal hand-out. Once the precedent of federal aid for local-works planning is set, the next move will be for the appropriation of federal funds for construction. The Congress now faces an issue far greater than the appropriation of $75,000,000. If the decision is in favor of the planning appropriation, an opening wedge will have been driven for billion-dollar obligations to construct the planned projects.

Harmful to Both Parties

THE JURISDICTIONAL DISPUTE now in progress on the Pacific Coast between the U. S. Engineer Department and the Bureau of Reclamation can only do harm to both organizations. The fight that has gotten into public print on the Coast is of national significance because it is indicative of a much more extensive controversy that has been going on under cover for some time. If these two federal agencies cannot agree as to how river development work is to be carried out in the zone in which their interests overlap, two alternatives are open to Congress. It can set up authorities to take over the development of all major river basins or it can put all river work under a central body like the Federal Works Agency, letting it determine what subsidiary organization should make the studies and do the construction work. As neither of these alternatives would be welcomed by either the Army Engineers or the Bureau of Reclamation, these two agencies should seek a quick settlement of the controversy.

Federal Construction Contracts

A BILL HAS BEEN INTRODUCED in Congress to require that all contracts for federal construction work be awarded on a negotiated lump-sum basis (*ENR* March 1, vol. p. 297). The bill has many defects, but its outstanding one is the proposed substitution of that form of contract for contracts let on the basis of publicly opened competitive bids. This is not to say that the old system does not have its faults, for it has, but we know its faults and they appear to be much less serious than proposed new system. The war made various forms of negotiated contract necessary as emergency measures when work had to be inaugurated before plans could be completed. However, those were emergency measures that should not be carried over into times of peace. Negotiations of this kind, if they are to have any real value, must be privately conducted. So conducted, they open the door to abuses similar to those that brought about the present system of public bidding for government work.

Voice for All Engineers

ERSUASIVE ARGUMENTS in favor of an organization to replace the American Engineering Council are made by Harold E. Wessman in his presidential address to the Institute of Consulting Engineers, which is reproduced elsewhere in this issue. Prof. Wessman would have the great engineering societies of America "again band themselves together in an overall organization through which they may exert one powerful voice on those matters of national interest in which all engineers have a common stake."

The basic reason for the failure of the American Engineering Council is the same one which has resulted in the creation of the large number of engineering societies that we have today. Engineers have few interests in common; their interests are as diverse as their occupations, and their thinking on national questions usually reflects the economic thinking of the industry or agency of which they form a part. Not only that; at times their views are diametrically opposed, as on the matter of public power development.

Opinions within the administrative board of the American Engineering Council on many national questions were so divergent that the council actually kept a large segment of the profession from being heard on matters of direct concern to it. For example, in the dark days of the early Thirties the council by its inaction effectively nullified attempts of the American Society of Civil Engineers to support the federal government in its plan to stimulate expansion of local public works. Had that society been acting on its own in those days rather than through the American Engineering Council it would have taken a strong stand in support of a large program of public works as an aid to economic recovery.

It was instances such as this in which the A.S.C.E. board found itself in disagreement with the A.E.C. board that finally resulted in the civil engineers withdrawing from the council. The electrical engineers followed almost immediately. Today the A.S.C.E. has a much more effective voice in Washington than it had when it was required to speak through the American Engineering Council.

While the American Engineering Council was still in existence the secretaries of the constituent organizations began holding meetings in conjunction with the annual assembly of the council to keep each other informed of developments in the several societies. After the abandonment of A.E.C. the secretaries of the four Founder Societies continued that practice, forming what came to be known as the Joint Conference Committee. Subsequently the presidents and most recent past-presidents of the societies were included and still more recently the American Institute of Chemical Engineers was added.

In the Joint Conference Committee engineers have the nucleus of a more satisfactory agency for joint action than can be provided by an independent body like the American Engineering Council. The name should be changed to make it more indicative of the purpose of the organization; and the organization might be expanded somewhat but it should not be enlarged to the point of being cumbersome.

One of the problems to be faced frankly by those who undertake to reorganize the Joint Conference Committee will be its relation to the National Society of Professional Engineers. That society is handicapped by some of the factors that made the American Engineering Council more of a liability than an asset to engineers, but as it now represents 22 state societies of professional engineers in Washington it must not be overlooked in the planning if an unfortunate conflict within the profession is to be avoided.

Need for the National Society of Professional Engineers never has been convincingly demonstrated, but if it is to be continued—which we assume it will be—it should be represented on the new central agency. But if that is done, there should be a definite understanding that the society will abandon its purpose of being the *spokesman* for engineers on all matters of national interest. The new agency should act as spokesman whenever joint action is desirable.

Such an arrangement should not deprive N.S.P.E. of the right to speak on matters of special interest to it, such as registration laws for engineers. Similarly, no one of the other engineering societies participating in the joint arrangement should be deprived of the right to take prompt and independent action on matters of special interest to its members. The chief objective of the new agency should be that of promoting joint action on matters of mutual interest. It should not be a damper on initiative with respect to matters of concern to only one of the constituent societies.

ENGINEERING NEWS-RECORD WALDO G. BOWMAN, *Editor* **Copyright, 1945, by McGraw-Hill Publishing Company, Inc.**
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Seabee Pontoons Form Floating Piers

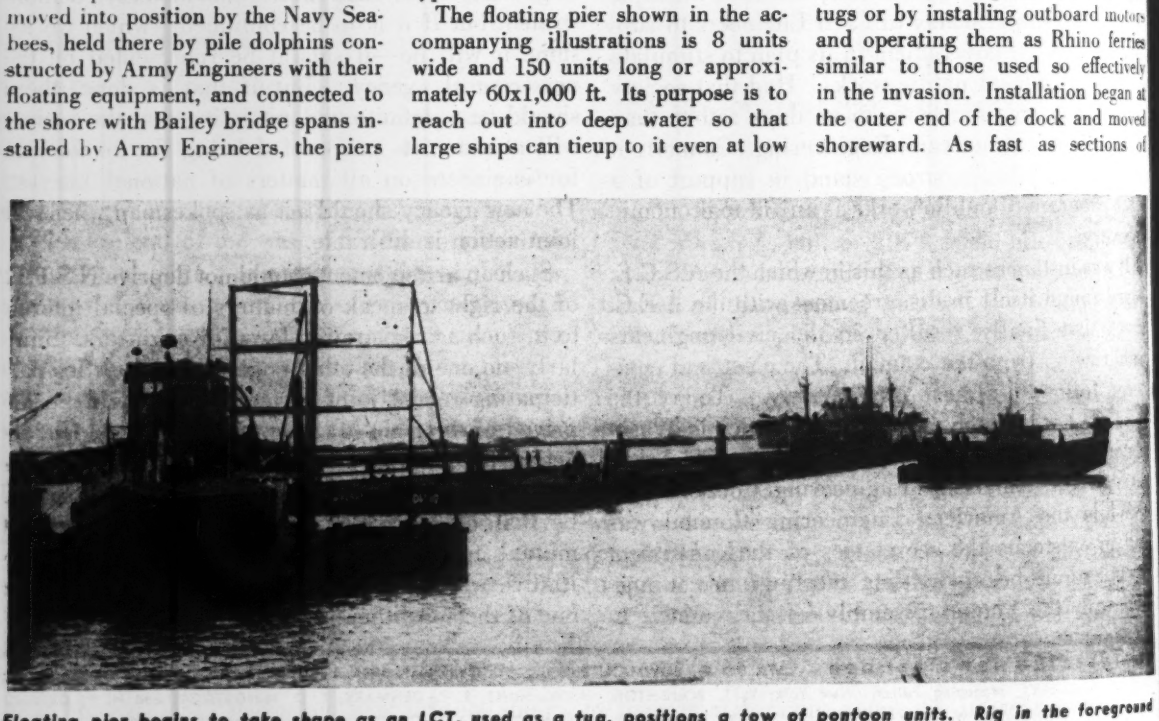
Waldo G. Bowman
Editor, Engineering News-Record
(By air mail from the European Theater of Operations)

***Contents in Brief**—Floating landing stages have been built at European ports to speed the unloading of supplies for our armed forces. Engineer forces of the Army and Navy cooperated in this work, steel pontoon units of the Navy Seabees being used to make the floats while Army Engineers provide Bailey bridges for the movable shore connections and drive the pile clusters to which the floats are anchored. This is the third of Mr. Bowman's reports from France on the activities of our engineer forces.*

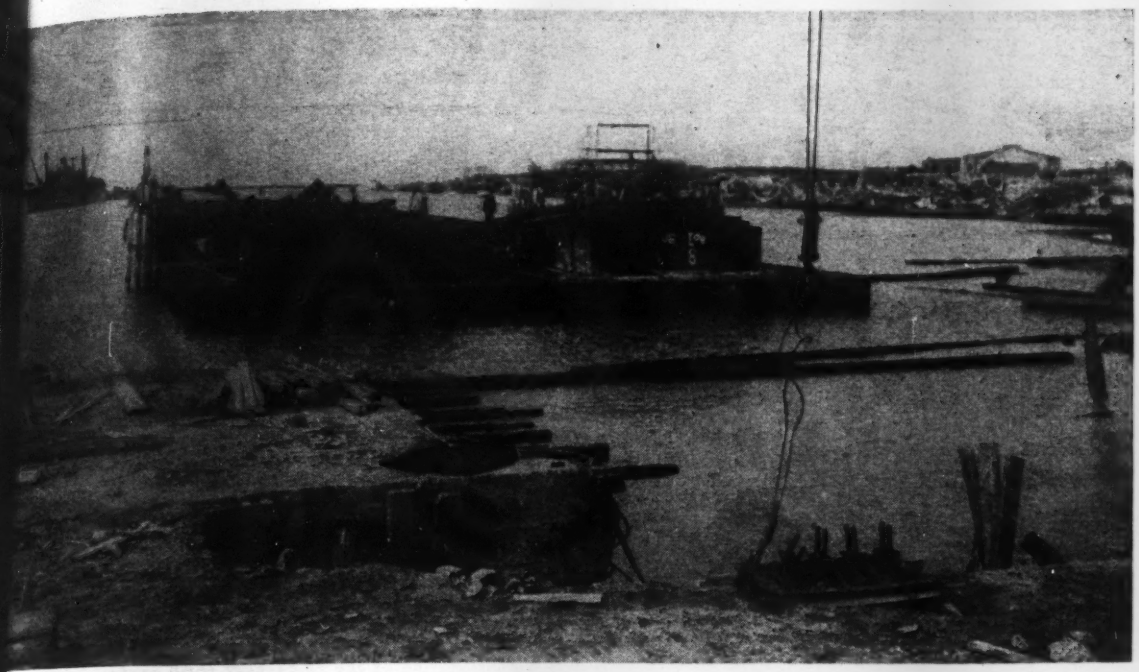
IMPROVISED PIERS, at which any ship afloat can tie up and discharge its cargo of supplies or personnel, have been installed in a number of European ports serving our military forces on the continent. Of floating design, involving the use of strings of 5x5x7-ft. steel pontoon units assembled and moved into position by the Navy Seabees, held there by pile dolphins constructed by Army Engineers with their floating equipment, and connected to the shore with Bailey bridge spans installed by Army Engineers, the piers represent the fruits of Army-Navy cooperation at its best. Although the details and the construction problems may vary slightly on different piers, essentially they adhere to the same pattern so that a description of a single installation may be considered typical.

The floating pier shown in the accompanying illustrations is 8 units wide and 150 units long or approximately 60x1,000 ft. Its purpose is to reach out into deep water so that large ships can tieup to it even at low tide, and so that ships of any kind or size, which can discharge their cargo with their own derricks, can speed up unloading time over that required if they have to be locked into a wet basin to escape the tide movements, which complicate unloading in many European ports. In some harbors, of course, there are no wet basins because of bomb or demolition damage to the gates, and in these cases the floating docks are almost indispensable.

The Seabees assembled the pontoon units at a shore-side point into manageable-size barges, which they then moved into position either with tugs or by installing outboard motors and operating them as Rhino ferries similar to those used so effectively in the invasion. Installation began at the outer end of the dock and moved shoreward. As fast as sections of



Floating pier begins to take shape as an LCT, used as a tug, positions a tow of pontoon units. Rig in the foreground is a barge-mounted scaffolding tower from which wire cable wrappings are placed around the pile dolphins.



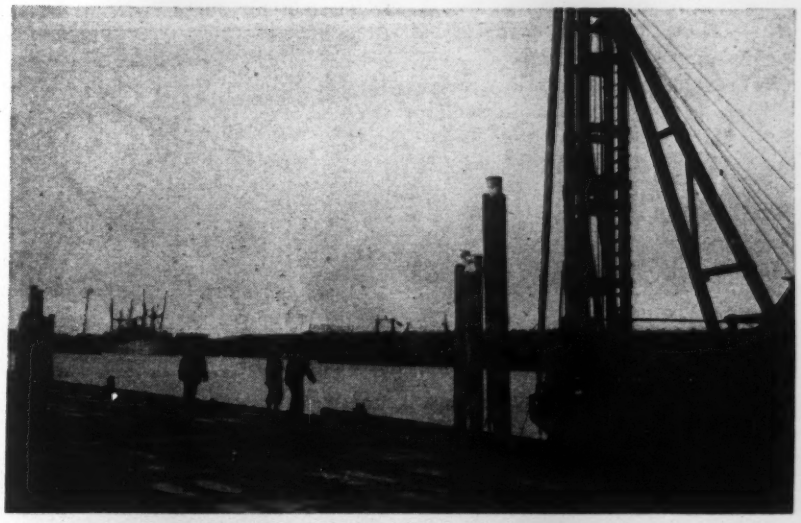
ting pier ready for Bailey bridge landing span. End group of pontoons carries timber ramps for vehicle entrance and . Note Bailey bridge shoe in foreground containing the special U-bolts to which the span will be attached.

k were floated in, pile dolphins re driven on either side by men an Engineer port construction and air group operating a floating ver.

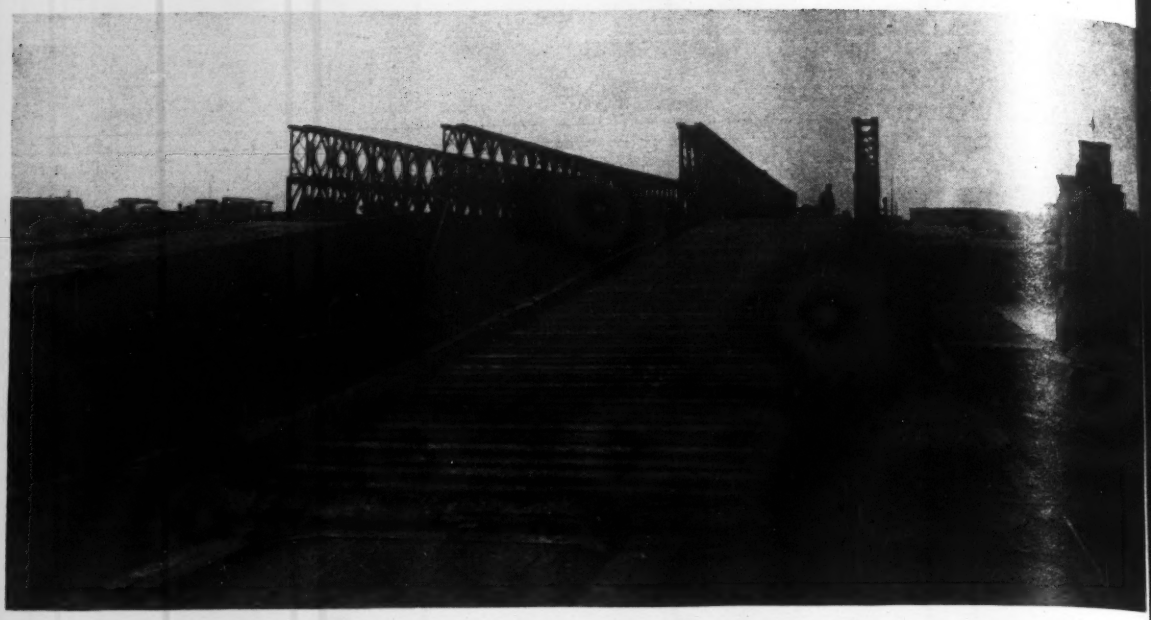
On this job, 19 timber piles, 90 to ft. long, were driven to 30 ft. netration to form the dolphins, ich were spaced 115 ft. apart. ese, at least, were the types of dol- ins used until a shortage of long ber piles developed as a result of ps' crews forgetting to cast off their rn lines, thus breaking the dolphins even dragging them off to sea. hen the last of the timber piles was ed in dolphin maintenance, the En- neers hit upon the idea of fashion- hollow steel piles from a supply captured German steel sheetpiling. stly stronger than a timber pile, se steel piles were driven in five- e clusters, which were at least fifty rcent stronger than the 19-pile tim- r design.

For wrapping the pile clusters with re rope (10 turns of $\frac{3}{4}$-in. cable 5 ft. d 25 ft. down from the top) an fective barge-mounted tower was de- loped, as shown in one of the illus- ations. The tower is U-shaped in an, as is the supporting barge of ntoon units so that it can be moved to surround the pile clusters. Scaf- lding platforms at different heights on the tower give workmen access to the wrapping at any tide level, and a 10-ton drum hoist on the barge provides the power to pull the cable up tight.

On the inshore section of the floating dock the Seabees erected two timber ramps, for incoming and outgoing traffic, each of which connected with a Bailey bridge that the Engineers built out from shore. With their upper ends resting on pontoon units 5 ft. high above the deck of the dock, the ramps were made of such length as to give a 10 percent grade.[1] This same grade continues over the Bailey bridges at low tide when their outer ends are down, decreasing as the tide rises until, at high tide, the Baileys are horizontal.



As soon as a set of pontoons is warped into the dock assembly, clusters of piles are driven to hold it in place. Until the supply of 100-ft. timber piles was exhausted, the dolphins contained 19 timber piles. Later five hollow steel piles, weld-fabricated from captured German sheetpiling, were used to provide even stronger dolphins.



Vehicles leave the pier over a ramp on a 10-percent grade connecting with a Bailey bridge span. This view is at high tide. At low tide the Bailey bridge span is inclined until it is a continuation of the 10-percent ramp grade.

Only slight changes in the end shoes were necessary to fit the Bailey bridge spans for this special service. In the conventional design the shoes are of rocker-bearing type, but with the necessity for inclining the spans as much as 10 percent, some means of postive anchorage of the span to the shoe was required. This was supplied by a set of U-bolts engaging the pin in the rocker shoe and also a new 2-in. diameter pin that was inserted directly above in holes drilled through the end post of the Bailey trusses.

With this positive fastening, the bridge was effectively tied to the shoe, and to the shore, and could safely tip as much as was required. At the barge end a similar U-boat detail was used, but here the shoe instead of being a rocker was made a flat plate. This plate was then set in a grease box so that it could slide longitudinally. A 6-in. movement was provided for, but the plate seldom slides as much as 1 in.

Junction of floating pier ramp and Bailey bridge. Bearing of the bridge is a flat plate set inside a grease box whose sides keep span from moving off supports.

Erection of the Bailey bridge was the most exacting task associated with the floating dock construction because it had to be coordinated with the fast moving tides, which go up and down as rapidly as 1 ft. in 5 min., and average half that exceptional rate throughout the 4½ hr. cycle. The Bailey spans were assembled on shore and cantilevered (launched) to the floating pier in the usual manner. But since this launching can only be done when the bridge is level, and since the pier pontoons, moving up and down with the tides, are only at this "level" position for a brief period, rather exact coordination is required. Moreover, the attachment of the abutment shoes also has to be made quickly before the tide recedes and the span starts to slope. Once in position, however, the entire assembly is stable, making the floating pier one of the developments to be added to the list of engineering successes that the war has produced.

For the Army, the pier work described here was handled by two Engineer port construction and repair groups, the 1055th under command of Lt. Col. Elmer H. Oechsle and the 1061st under command of Lt. Co. W. P. Moss. The Seabees, who assembled and installed the pontoon units, belonged to the 28th Naval Construction Regiment, and later the 114th Construction Battalion took over.

A Unified Profession Needed

Harold E. Wessman
Past-President, American Institute of Consulting Engineers

Editor's Note—In his presidential address before the annual meeting of the American Institute of Consulting Engineers in New York in January, Harold E. Wessman, chairman of the Department of Civil Engineering at New York University, recommended that the engineering profession again undertake to provide itself with a voice that could speak for the profession on questions of engineering interest. Because the lack of such an agency is a matter of concern to many engineers, we are reproducing Prof. Wessman's address now so that it may reach a much greater audience than heard it on Jan. 15. Supplementing Prof. Wessman's statement is comment in the editorial pages of this issue outlining in more detail the present plans for giving engineers a common voice in national matters, also some observation on why American Engineering Council failed in its basic objective. The whole subject is one warranting active discussion.

I TALK TO YOU this evening is not about a reality but about a dream, a dream which is shared by many engineers in this land of ours. The central theme of this dream is the hope that the great engineering societies of America will again band themselves together in an overall organization through which they may exert one powerful voice on those matters of national interest in which all engineers have a common stake.

Nearly 100 societies

It has been estimated that there are more than 90 engineering societies in the United States and that they represent approximately 200,000 engineers.

The largest one is the American Institute of Electrical Engineers with a membership of 22,600 in round numbers. Next comes the American Society of Civil Engineers with 20,000 members. The American Society of Mechanical Engineers has 18,600 members, whereas the American Institute of Mining and Metallurgical Engineers has 13,600 members.

These four societies constitute the group termed the Founder Societies. Then there is the American Institute of Chemical Engineers with 4,900 members. These five societies together represent over 80,000 engineers, but in general they speak with five different voices, if they speak at all. The Society for the Promotion of Engineering Education, whose members for the most part are also members of the preceding organizations, represents approximately 3,700 engineering teachers and administrators, but it has a voice all its own.

In general each of these organizations pursues its own way with no attempt to coordinate its program with that of other groups. Is it any wonder that the engineer's voice is seldom heard in Washington on matters of national policy. Any one group of engineers with sufficient interest in some issue to speak its mind will get at best only a perfunctory hearing, either because it doesn't carry enough weight or because another professional group voices a contrary opinion.

One voice for law and medicine

Contrast the situation in the engineering profession with that in medicine and in law. The American Medical Association, with more than 120,000 members, represents the entire medical group. We do not find 50 independent medical societies. The American Bar Association has approximately 32,000 members and if it makes a statement of policy it speaks for the entire legal group.

Now, it is neither necessary nor desirable to wipe out 90 engineering societies and start anew with one comprehensive organization. But on the other hand, it is extremely urgent to establish a congress or council of engineering societies through which engineers can present a unified front to the nation. It is true there are difficulties involved in perfecting such an organization but I am sure that among the different branches of engineering there is enough wise counsel and organizational ability to overcome them. We have worked together in the Engineers Council for Professional Development and in the former American Engineering Council. We can work together again, profiting from past mistakes to achieve a harmonius, smooth-functioning, efficient agency through which we may express a unity of thought on those matters that concern all engineers, regardless of branch or specialty.

The Joint Conference Committee

An excellent example of the value of joint action was provided recently when the five presidents of the great engineering societies previously mentioned issued a statement suggesting a reasonable plan for handling German industry after the war so that never again would Germany have the industrial resources to plunge the world into conflict. But the Joint Conference Committee, made up of the presidents, most recent past presidents and the secretaries of the Founder Societies, effective as it has been this past year, is not enough. The presidents may live and work in close proximity one year. The next year they may be scattered over the country making it difficult to get together for discussions. Moreover, they only hold office for one year. Under such conditions, it is impossible to secure an effective continuity from year to year. As Congress and the federal departments evolve their plans for handling Germany and Japan after this terrible war, where is the permanent organization that will continue to press the viewpoints of engineers and scientists

on problems which involve so many technical aspects but which are decided primarily by the lawyers who dominate our government?

One of the tragedies which befell the engineering profession in recent years was the virtual death of the American Engineering Council in 1940. It may be true that it had become somewhat ineffective, but instead of reorganizing it and making it a powerful voice in the affairs of this country, it was allowed to suffocate at a time when the need for such an agency was never more acute. I am sorry to say that the American Society of Civil Engineers, of which I am a member, was primarily responsible for the end of American Engineering Council.

If anyone believes that there exists no need for united action by the engineering profession in expressing opinions on national policy or on matters of common concern to all engineers, let him consider not only what has happened in the past few years but the implication of things to come.

I have already referred to the suggestions made by the five engineering society presidents for the handling of German industry when peace comes. This is only one of many technical problems that will arise in connection with peace plans. The engineering profession has a distinct responsibility in these matters and if we do not help to decide them you may rest assured that others will.

Subjects of common interest

The voice of the engineer should have been heard in Washington when Selective Service policies were being established in this country. As a result of our lack of foresight and unified action then, we now have ourselves to thank for a lost generation of engineers and scientists. I refer particularly to those who would have completed advanced study. Before the war is ended, most colleges will have experienced a four year lapse in the full time training of graduate students. Our national reservoir of potential research workers and qualified teachers was allowed to run dry. In this connection, it is of interest to note that when the War Department abandoned most of its Army Specialized Training Program in the colleges, the American Medical Association immediately went to work and as a result the largest quota by far of those army men earmarked for complete training was allocated immediately to the medical profession.

There is the matter of labor relations for engineering employees. Here we find the American Society of Civil Engineers attempting to play a lone hand, when the problem is one which concerns all branches of engineering and one in which a common course of action should be pursued by all of the great engineering societies.

It is astounding to me that a group in the American Society of Civil Engineers proposes that local sections of this great society should organize groups of professional employees, embracing electrical, mechanical, and chemical engineers, for collective bargaining purposes without first establishing a liaison and common policy with our sister societies.

Universal military service

There is the problem of universal military service in peace time. The Society for the Promotion of Engineering Education has a committee studying this question. Other technical societies have committees, I believe, to study the same question. But unless the engineering profession can present a unified front behind a plan whereby military training and the technical training of army specialists is coordinated with the engineering training given in college, I am inclined to believe that the plan finally adopted will be little to our liking.

Most of us in engineering education have encountered many illustrations of misapplied manpower in this war. We hear from our former engineering students constantly about this. I am afraid there will be many more illustrations of this in the peacetime training plan unless the plan is so worked out that electrical engineering students will be used in military training where their electrical engineering background is of value and civil engineering students are used where their civil engineering training is put to the best possible use.

There is the question of the maintenance of War Department research programs in the years to come so that future wars, should they occur, will not wind up "behind the 8-ball" in scientific developments.

There is the problem of professional licensing which comes to the fore again by virtue of the recent decision of the Illinois State Supreme Court declaring the Illinois licensing law unconstitutional.

There are problems associated with postwar planning and reconversion. How to provide and maintain 50 million jobs in the face of a staggering annual federal budget which threatens to choke all incentive to private enterprise, is a problem demanding the most intelligent consideration and cooperation by all groups in this land. I do not need to remind my readers that when a depression occurs, the engineer and scientist are placed on the defensive by charges that they have created technological unemployment with their labor-saving devices.

I am not concerned in this paper with proposing the details of organizing a federation of engineering societies. I do suggest however that the Founder Societies and the American Institute of Chemical Engineers be urged to appoint immediately committees to meet in joint conference and draft the outlines of such an agency.

No insurmountable obstacle

Some defeatists will say that it will take a miracle to get engineers to agree on a common policy in connection with any issue. Well, we have already seen miracles performed by engineers in this war. Recall what has happened since 1939. The building program alone to house our Army and Navy cost more than all the buildings in New York City from Manhattan to the Bronx. Millions of tons of shipping have been launched. Over 230,000 planes have been built. Tanks, guns, ammunition, and all of the other paraphernalia of war—the record is amazing. Our enemies may say that we performed a production miracle and yet we know that it was essentially engineering brains and organizing genius that was responsible.

It will take no miracle to achieve a unified profession. But it will take some of that same organizing genius which has characterized the superb contributions of the engineer to our war effort. If our representatives go into organizing conferences with a spirit of compromise and the conviction that the area of agreement is vastly greater than any possible field of disagreement, then once again will we have an effective cooperation by the great engineering societies in a mission of service to the nation and for the profession.

Tough Tunneling at Leadville

Editor's Note—Reminiscent of tunneling troubles at Moffat, San Jacinto and the Bronx River crossing of New York City Tunnel No. 2 are the difficulties in driving the 3-mile Leadville (Colo.) drainage tunnel. After three blow-ins in two weeks the crew tried bulkheading off the original heading and picking up for a bypass around the bad ground, only to run into more trouble at the junction, and even worse bad ground ahead. Numerous fault zones, carrying water under 180-ft. head, laboriously have been traversed with intensive use of concrete lining carried along with the excavation, concrete bulkheads containing drainage systems, guniting, grouting and probing ahead with test holes. Hot water in the grout mix counteracted 37-deg. temperature of groundwater, and oats were included at times to seal off small cracks while the grout set. Under construction by the U. S. Bureau of Mines, the bore will drain the deep workings of many of the critical-metal mines of the district.

"TOUGHEST ground I ever saw," John A. Austin says in describing conditions at the drainage tunnel he is driving for the U. S. Bureau of Mines at Leadville, Colo. That statement covers a lot of ground, both good and bad, for veteran tunnel driver "Long John" Austin has poked many a hole through the hills of this country.

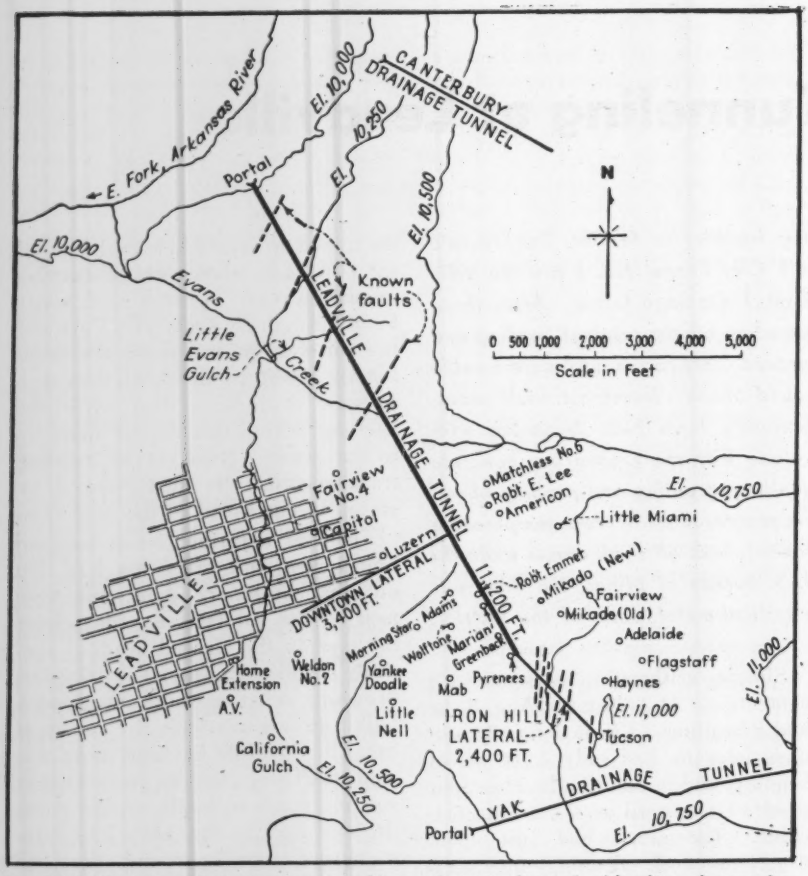
Simple arithmetic bears out his contention. At 1:20 a.m., Aug. 8, he had a heading 2,126 ft. long; 30 seconds later he had only 1,700 ft. of heading, and in addition had lost four muck cars as well as a mucking machine. The crews had just spent nearly a week cleaning up 2,000 cu. yd. of mud run that poured into the tunnel through a hole in the top of the rock face, when without warning another stream of mud and water burst through the same hole. Cars and mucker were pushed down the heading for 400 ft. by the flood, then they jammed to form a dam while the heading behind this barrier filled up to the crown. Breaking all existing track records, the men escaped by sprinting out ahead of the mud flow.

Then, as a further insult to good tunnel men, just after they had dug out the machinery dam and were nearing the old face, five days later the roof in the cleared heading suddenly disgorged a heavy flow of water, drowning out the works. A wooden bulkhead was hurriedly thrown up at Sta. 18+00 while the next move was studied. Three blow-ins in two weeks was too much to battle, so the crews dropped back to Sta. 16+71 to drive a bypass tunnel around the bad ground 35 ft. to one side. The old heading was bulkheaded with concrete containing weepers to relieve the water pressure.

While the decision to drive a bypass around the difficult heading was a logical one, it did not end the troubles, for the bypass line ran into even worse ground than had been originally encountered. In fact, trouble started at once when timbering at the junction of the Y threatened to give way under a suddenly increased load. Only by quick work in concreting the walls and guniting the roof was the junction saved.

Then as the fault causing all the trouble in the original heading was again approached, ground and water runs required carrying full concrete lining along with the excavation, but the fault zone could not be crossed until a concrete bulkhead had been built and the ground ahead and outside of the lining had been consolidated with pumped concrete and grout. A series of runs as successive faults were encountered were likewise eventually choked off by grouting, but caused considerable difficulty. Eventually the heading entered good

Cars and mucker piled up into a dam by inrush of mud at Leadville Tunnel



Leadville Tunnel will drain deep workings of many famous old mines, increasing production of vital war minerals from this district.

ground, and while numerous faults are known to exist ahead, test holes probing ahead will reveal their location, and from experience already gained the crews expect no real further trouble.

To drain famous mines

The tunnel will drain deep workings of long-famous mines in the Leadville district, whose shaft collars lie above El. 10,000 near the roof of the continent. Old shafts like the Pyrenees, Tucson, Greenback, Morning Star, Evening Star, Wolftone and scores of others will be dewatered to permit working their rich veins once more. Leadville started as a placer gold camp in 1859, but with discovery of lead-silver ores 15 years later shaft houses began to appear around the hills and gulches surrounding the town. Up to the start of the depression in 1932, the camp produced nearly half a billion dollars in precious and base metals. The prosperity of Leadville, in common with all mining centers, fluctuated with the price of metals, yet the camp lived through all booms and slumps until 1932.

The geology of the district is complex, consisting of badly-faulted granite, quartzite, limestone and porphyry, topped with water-bearing glacial moraines that soak the fault zones. Water has always been a problem in the underground workings, though during times of high prices for metals expensive pumping operations could be maintained. Two tunnels, driven years ago, the Yak in the southeast, and the Canterbury in the northeast section, provide some drainage relief for those areas, though they do not serve the main district.

With the price slump in 1932, pumping, and even mining, became unprofitable and all activity ceased. Interested parties tried to obtain federal financing for a long drainage tunnel from the southwest in 1934 in hopes of reviving the camp, but as the project met neither WPA nor PWA requirements nothing ever came of the scheme. It took the war demand for metals to get the government interested in opening the mines for production of critical lead and zinc.

A drainage tunnel for dewatering the deep levels was more logical than installation of scarce and expensive pumping equipment so the Bureau of Mines investigated all proposed plans for tunnels. The 1934 proposal of a five-mile low-level tunnel from the south was best for draining the entire area, but this plan was discarded, because of expense and length of time for construction, in favor of a shorter tunnel to be driven from the north at higher level, with laterals tapping the more important areas. The adopted system, while higher than some deep workings, will permit their unwatering by pumping against low heads into the tunnels.

In 1943 Congress appropriated $1,400,000 to the Department of Interior for driving the tunnel. The Bureau of Mines was designated by the Secretary of Interior as the agency to prosecute the work, and construction got under way in December, 1943. Secretary Ickes has hopes of the government eventually being reimbursed through collection of royalties on ores produced by benefitted mines. It is expected that some 4,000,000 tons of ore containing zinc, lead, silver, gold and manganese will be made accessible by the tunnel, estimated to drain about 10 billion gallons of water.

The project calls for a bore 9x10½ ft. in section, which can be used as a haulageway if desired from low-level workings. Starting at an elevation of 9,957 ft. in the valley of East Fork, Arkansas River, north of Leadville, the tunnel is being driven southeastward for 11,200 ft. to Pyrenees shaft on a slight upgrade. From Pyrenees a lateral known as Iron Hill will be extended 2,400 ft. to Tucson shaft, striking these workings 1,000 ft. below the surface. Another branch, Downtown Lateral, 3,400 ft. long, is proposed to tap a group of mines lying at the southeast corner of the city. The appropriation is not sufficient to include concrete lining throughout, but both concrete and gunite are being used in bad ground. Elsewhere, in sections requiring support, timber will be left in place. While the bore is being driven to full section, muck 18 in. deep is being left in the center to carry a raised track, permitting installation of wood-lined drainage ditches along both sides as tunneling proceeds.

In general the project resembles the -mile Carlton Tunnel driven four rs ago (*ENR* Nov. 7, 1940, vol p.) to drain the deep mines at ipple Creek, although the Leadville n is not as clear cut as was the lton job. At Leadville records of old mines are incomplete, so the ct location and depth of many of workings are not known. The en- neers are certain, however, of drain- most of the shafts as well as much the glacial drift that absorbs the rface water coming from peaks wering 4,000 ft. above the district. e main tunnel will be driven, then laterals will be extended as far as isting funds permit.

Bad ground at start

Tunneling equipment arrived on the b Dec. 23, 1943. Bad ground was en- untered at the start, for the portal nd first 700 ft. of tunnel lie in uncon- lidated glacial drift. After 300 ft. e bore became wet, adding to the fficulties in holding the ground. Sets 10x10-in. Oregon pine timbers, ith vertical wall posts and three-piece rches, were placed every 4 to 6 ft. hrough this ground. Lagging was lso required on the sides and roof, nd for some distance excavation was ossible only by the use of crown bars riven ahead of the last set and with reastboards holding the face. All agging and packing is native timber urnished by local sawmills.

At Sta. 3+50 rock was struck at ottom of tunnel. This ledge rises lowly, taking 400 ft. to reach the rown. Thus, for a long time the rews were drilling and shooting the ower section while trying to hold a eavy gravel roof. For some distance top heading was carried ahead to drain a heavy water flow that fol- lowed the rock contact. Even after full section rock was encountered, the formation was so badly shattered as to require timber sets, partly lagged, to the fault at Sta. 21+26 where real trouble was met. Despite the heavy timbering the crews were driving about 200 ft. per week.

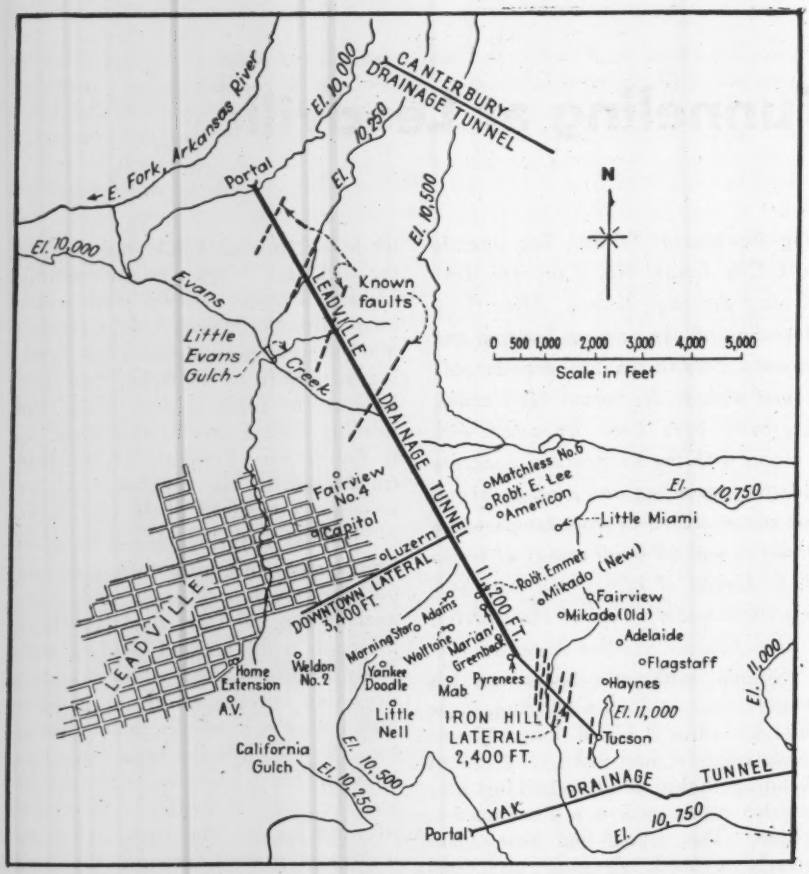
On Aug. 2, in fairly good ground and just after a dry intrusive por- phyry dike was encountered, a heavy run of water, mud and sand broke through the upper left of the face at Sta. 21+26. The material piled up in the heading on a long slope, but the run stopped as suddenly as it started. Some 2,000 cu. yd. of material was cleaned out by the mucking machine, and the face was again reached at 1:20 a.m., Aug. 8. Four loaded muck cars and the mucker were still in the heading, close to the face.

Little warning was given of what was to come, only the creaking of the last four sets of timbers as they sagged under a new load. A few seconds later a rush of decomposed prophyry and water came out of the same hole that disgorged the run a week earlier. The men escaped by sprinting ahead of the flood and the dinky skinner got out with his locomotive, but the four cars and mucker were tumbled end over end by the inrushing mud. The equip- ment jammed into a crude barrier 400 ft. down the heading. While the mud filled the heading behind the dam, water continued to squirt through the tangled mass for several days.

An attempt was made to regain the heading. The dam of machinery had been removed and 100 ft. of progress had been made in advancing through the muck when the third disaster oc- curred. On Aug. 13, at Sta. 18+30, the roof suddenly spouted a deluge of water carrying sand and gravel, through apparently solid ground. Fearing another blow-in the crews hastily erected a timber bulkhead on the portal side of the flow at Sta. 18+00. Weepers in the barrier re- lieved the water pressure. Apparently an underground lake or stream had broken through the face on the Aug.

Heavy ground threatened collapse of timbering at junction of bypass and abandoned heading (left) until timber was incased in reinforced gunite.

It took a concrete bulkhead fitted with drain pipes, to finally stop flow of wet ground into main heading, later abandoned in favor of bypass tunnel.



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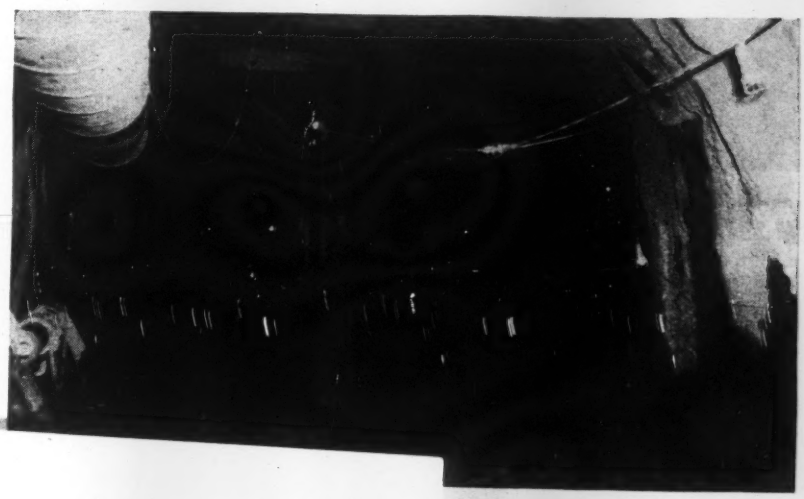

bering at junction of bypass and ıcased in reinforced gunite.

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rain pipes, to finally stop flow of wet ed in favor of bypass tunnel.

Low-bed jumbo, mounting five drifters, drills the rounds in good ground. Bits are detachable, hot milled on the job.

Safety is enhanced by this new type man car, with high-back seats turned inward. Double four-wheel trucks minimize chances of derailment. Muck car at right has smooth sides, and is dumped by inserting a tipping arm into a slot.

8 blow, and, when blocked by the filling of the heading, worked back to the first weak place in the roof.

That ended all attempts to drive through this area on the original line. Some consideration was given to compressed air operations. However, test holes from the surface revealed a groundwater level 180 ft. above the tunnel at this point, and holding such a head by air would require working pressures in excess of 80 lb. Then, too, the test holes showed a thin rock cover of only 4 to 12 ft., caused by a big depression in the rock ledge. Therefore, it seemed best to drop back some distance to drive around the troublesome area with a bypass. Meanwhile, the old heading was sealed off with a concrete bulkhead at Sta. 17+93, fitted with long 6-in. weepers thrust through 8-in. pipes in the barrier and extending into the saturated ground beyond the wooden bulkhead.

The junction for the bypass was started at Sta. 16+[illegible], about 500 ft. back of the old face. Here the tunnel was widened out and heavily timbered, and the new heading was lined out 35 ft. to the right of the original bore. Meanwhile, the stub of the old heading was concrete lined to prevent possible blow-ins on the open side of the bulkhead.

The junction chamber was almost lost when a sudden shift of ground overhead threw excessive loads onto the timbering and threatened its collapse. Forms hurriedly thrown up along the walls were filled with hand-shoveled concrete, while the roof was encased in layers of reinforced gunite. Then grout holes were drilled through the arch to consolidate the ground overhead. Grout refused to set, however, until hot water and a calcium chloride admixture was used in the mix to counteract the effects of 37 deg. temperature of the groundwater. Grout injection was continued until the gages registered pressures of 750 to 1,000 psi. Sawdust added to the grout helped seal cracks in the crown and prevented the cement mixture from coming back into the tunnel.

More trouble ahead

Driving of the bypass heading proceeded cautiously, with 30 and 40-ft. test holes probing ahead to determine the ground conditions. The thin rock cover persisted, offering little protection from the threat of a blow-in from the surcharged underground basin above, so excavation was by pneumatic spades as far as possible, with drilling and shooting kept to a minimum. When the porphyry dike was again encountered, it was found to be dry though disintegrated, but the contact zones on both sides were badly shattered and wet.

In this stretch a concrete lining—monolithic walls and gunite roof—was carried along with excavation. Test holes showing water were grouted to consolidate the ground ahead, and numerous weepers were drilled through the lining. At Sta. 22+00 the dike was safely passed, and the heading entered supposedly solid Leadville limestone. However, the limestone lasted only for 50 ft., when another very wet fault was crossed, leading into a formation of dolomites and quartzites. A heavy flow of water was the only trouble encountered here, as the contacts on either side of the fault were hard.

Warning of more trouble was given
en the advance test holes struck a
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ued to pour into the heading at the
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ore the ground ahead. The explora-
on was cut short by a surge of mud
nd sand, along with a water flow of
,000 g.p.m. into the heading through
e hole. Grouting ahead of the bulk-
ead was attempted, but the ground
as so shattered that no grout pres-
ure could be built up and grouting
ad no effect on the flow of water.
Obviously the situation called for un-
sual tunneling methods of some kind.

Hot water, cement and oats

The first step toward recovery of
he heading was to build a heavy con-
rete bulkhead, fitted with 4-in. pipes,
t the face. Then it was backed up
with 11 cu. yd. of concrete pumped
hrough the pipes in an effort to con-
olidate the ground. Next, holes were
drilled through the bulkhead for grouting beyond the concrete. Grouting proved useless, however, for the cement was carried back along the outside of the tunnel by water pouring into the heading through cracks in the concrete lining. Some means had to be found to check the flow outside the tunnel periphery.

As far back as 40 ft. from the concrete bulkhead the walls and arch of the lining were pierced with holes for grouting. Even though hot water and calcium chloride were used in the mix to accelerate setting, the grout failed to plug the innumerable cracks in the fractured ground. Then oats were added to the grout mix on the theory that they would expand upon becoming saturated and thus aid in filling the cracks. This scheme proved successful, especially after a second set of longer holes were drilled through the consolidated shell immediately surrounding the tunnel, through which the same oats mixture was pumped. Then long weepholes were drilled beyond the outer shell to relieve the water prssure.

With the flow of water thus shut off along the outside of the tunnel, it was now possible to grout beyond the concrete bulkhead through holes up to 40 ft. long fanning out beyond the tunnel outline. However, it took 2,248 sacks of cement to consolidate the ground immediately ahead. Then a 4x6-ft. top heading was blasted through the bulkhead and carried through the grouted area without trouble. Enlarging the heading to full size was also carried out without difficulty. Examination of the consolidated ground from Sta. 23+28 to 23+56 showed thousands of cracks from $\frac{1}{8}$ in. to 8 in. wide had been effectively sealed with grout, although one small unconsolidated pocket of mud was encountered.

Test holes probing beyond the heading revealed another wet fault at Sta. 24+40 that threatened trouble again. Here, however, sound rock between the face and the fault served as a bulkhead for grouting. After 1,448 sacks of cement had been pumped into the fault zone the ground was consolidated enough to permit driving through.

The tunnel is now back in Leadville limestone, and while several large faults are known to lie ahead, the procedures developed are considered suitable to overcome any further trouble.

Excellent equipment on hand

In these days of war scarcity many jobs must get along with old or makeshift equipment, but the Leadville project is splendidly equipped for fast and efficient operation. Two new 1,750-ft. compressors, each powered by a 250-hp. synchronous motor, furnish the high-pressure air. Ventilation is by two positive displacement blowers, each delivering 7,000 c.f.m. to the heading through a 20-in. spiral-

Goodhousekeeping means efficiency and safety on tunnel work. This view, taken from above the portal, shows the carpenter and machine shops, compressor house and office. Note lined ditch draining water from the tunnel.

welded pipe. As the blowers are nonreversible, change in direction of air flow is effected by the use of dampers in a loop piping arrangement at the fans.

Even the 24-in. gage track in the tunnel is excellent, made up of 52-lb. rail obtained from the abandoned Idaho Springs narrow-gage line of the Colorado & Southern Ry. Though rolled in 1886 and in use for over 50 years, the rail is in good condition, providing a solid, smooth track that means so much to fast tunneling operations. Muck cars are smooth side, 91-cu. ft. capacity, automatic dumping, known as the Granby type, developed on the Carlton Tunnel but greatly improved. Formerly they carried an arm on the side that engaged a tipping ramp on the dump, but these new style cars are dumped automatically after tipping arms are slipped into recesses on the car sides at the dump.

Mucking and drilling

A small air-operated mucker of the overshot type is now in use, but John Austin is revamping a similar machine into a two-car loader by adding a belt conveyor on a long back boom. It will be used with a California switch for shifting cars in the heading.

Drilling is from a track drill carriage mounting five new power feed drifters, with five more on hand for spares. All drilling is by detachable bits, hot milled on the job. Rounds are drilled only 5 to 7 ft. deep, just enough to pull the length of one bay of timbers. So far the ground has varied so much that a standard diagram of drilling and loading has not been developed.

Plant facilities

The outside plant is clean and well laid out. Compressors and battery charging and changing stations are located in one building. Another houses a well-equipped machine shop and blacksmith shop that includes an oil furnace, sharpener and cutoff wheel for preparation of drill rods, and two furnaces and a hot mill for sharpening the bits. This structure and all its contents were destroyed by fire the first week of the job, but it has now been rebuilt of fireproof material and equipped with new tools. A third building in this group is a carpenter shop, fitted with an all-position power saw for cutting the timber to length and shape.

Despite the year-around cold weather in this high altitude the men are kept comfortable in a large, heated change house equipped with showers, individual lockers and overhead racks for drying wet clothing. A stoker-fed central heating plant takes care of all buildings with a minimum of trouble.

Haulage within the tunnel is by storage battery locomotives but a gas locomotive takes the muck cars from portal to the dump. A concrete and grout mixing plant sets out of the way on the dump lead track. A newly constructed transmission line delivers current at 2,300 volts to a transformer at the job.

All safety precautions are used, including a new type man car for transporting the crews to the heading. The men sit on facing seats running lengthwise of the car and lean against a substantial back rest that prevents spilling of the men in case of derailment. Double trucks under each end of the car minimize derailment possibilities.

Direction

Robert A. Elgin is supervising engineer and contract officer for the U. S. Bureau of Mines. Contract for the tunnel was let to Stiers Bros. Construction Co., St. Louis, Mo., on a cost-plus-fixed-fee basis. John R. Austin, who is project manager for the contractor, also has his own firm, which is renting to the government most of the equipment in use on the project. Louis Stiles is tunnel superintendent.

Power Plant to Aid Development of Brazil's Northeastern Territories

Brazil has completed plans for a hydroelectric project on the Sao Francisco River as the first step in a big program to develop her northeastern territories, according to the Brazilian Commission of Inter-American Development.

The Sao Francisco River is among the mightiest of the great Brazilian waterway systems. Rising in Minas Gerais in the south, the Sao Francisco flows northward through that state and Bahia as far as Pernambuco to turn eventually southeast and follow that course to the sea. For nearly 1,800 miles of its 2,000-mile-length, the river is navigable.

Brazilians call the river the "Brazilian Nile", because of the fertility of the land it drains, and because it connects the northern and southern regions of the country. Another popular term for the great waterway is "river of unity."

The Commission, in a survey of Brazilian water power resources, refers to the Sao Francisco river system as "the greatest hope of the country for the industrial and agricultural development of the northeast."

Project site selected

The point where the river divides the states of Bahia and Alagoas has been selected as the site of the hydroelectric development. The project, according to the Commission, has been designed to provide a minimum of 500,000 hp. in electric energy. The total potential energy of the river system is estimated at 2,000,000 hp.

The Commission gives this summary of the Brazillian Government's program for the northeast territories:

"The plans for the utilization of the hydraulic potential of the Sao Francisco River system were perfected with the view to developing agriculture and industry in those regions within the radius of transmission lines.

"Plans are made for the establishment of industries utilizing local prime materials. These industries in turn are to be served and maintained by other agricultural enterprises also to be established.

"The technical economic concept of the entire development is well balanced and fitted into the principles of rural sociology."

The survey was made public in Washington by the parent Inter-American Development Commission, which maintains offices in the Commerce Department Building.

FLOATING DRYDOCKS U. S. NAVY

● The floating drydock is one of the war's new and potent weapons. It is new because many of the units built are of types not envisioned before the war. It is a potent weapon, because these mobile repair facilities enable us to plan naval strategy without dependence on the availability of fixed bases. Our largest battleships now can be lifted out of the water for repair at many places throughout the Pacific.

● For many months, details of the floating drydocks were shrouded in secrecy for strategic reasons, and even today all information concerning them is not being made public.

● These drydocks are products of the Bureau of Yards and Docks of the Navy built with the aid of construction contractors and steel erectors. This description of their design and construction is based on studies and field observations at the 28 yards where the floating "sickbays" for the Navy's fighting ships were built.

An

ENGINEERING NEWS-RECORD

Report

MARCH 8, 1945

Floating "Sick Bays" for Our Fighting Ships

Hal W. Hunt
Associate Editor, Engineering News-Record

● **Civil Engineer Corps and civilian personnel of the Bureau of Yards and Docks of the U.S. Navy and engineering firms and contractors associated with them, have been engaged on a huge floating drydock construction program. These dock facilities of the Navy have been expanded to keep pace with the greatly increased tonnage of fighting and merchant ships now afloat, as well as to provide for the far-flung operations of war over the seven seas. These "movable bases," built for and under the general direction of the Bureau of Ships, have enabled the Navy to extend the "time-in-service" of all classes of vessels from work-boats to battleships.**

● **Floating drydocks have long been built of wood, steel or a combination of these materials. This practice has been followed in the Navy's program, but, in addition, they have also been built of concrete. Some of these concrete dock units have been towed to far parts of the Pacific and have proved entirely satisfactory in operation.**

● **Built as a facility for ships rather than as ships — although they are floating vessels — the construction of floating drydocks has been primarily a civil engineering operation. The program has required the building of unusual waterfront facilities for assembly of the vessels. Practically all of the construction has been done by steel erectors and general construction contractors, based on designs made by civil engineers rather than naval architects.**

● **Floating drydocks in the current program were built at 28 yards, using a variety of methods, some familiar to shipbuilders but many with antecedents in normal construction practice. This report, in addition to presenting descriptions of the new drydock designs covers briefly the construction operations at all of the yards. A half dozen of the more significant procedures will be described in detail in subsequent issues.**

THE PHENOMENAL PROGRESS of our war in the Pacific, as well as the success of our landings in North Africa, Italy and France, has been attributed to many things—aircraft carriers, landing craft, 16-in. gun battleships, 35-knot destroyers, tankers that fuel the fleet at sea and just plain overwhelming numbers of ships, airplanes and men. Each of these things has indeed played its spectacular part, but in the final analysis no one of them will probably be considered any more important than a very prosaic and seldom mentioned item—the floating drydock. It is in these sick bays for ships that battle damage is repaired and general maintenance is administered, thus keeping the fleet in service. And it is only the ships that are ready to fight that win battles.

Paradoxical as it may sound, the familiar floating drydock is one of this war's new, secret and potent weapons. It is new because the majority of the types now in use were not in existence before the war. It is secret in that few people, including our enemies, know the extent to which we have increased our floating drydock fleet or that we have docked some of the largest battleships afloat at points in the Pacific where a few weeks before no facilities of any kind had existed.

Bases go with the fleet

And finally, the floating drydock is a potent weapon because in the number and range of sizes that we have available rests our ability to base our strategy on a mobile concept of naval warfare as distinct from the old static concept in which huge permanent repair bases were located at about 2,000 mile intervals; witness our prewar arrangements—San Francisco, Pearl Harbor and the Philippines; or Britain's bases at Alexandria, Ceylon and Singapore. Thanks to our floating drydocks we are no longer tied to established bases; we establish them as we need them and as near the fighting zones as we wish.

Creation of this great drydock fleet for use by the Navy's Bureau of Ships was entrusted to the Bureau of Yards and Docks and its Civil Engineer Corps officers. Some of the designs were turned out by the Yards and Docks staff, others by private consulting firms, while the building of the docks was let to 23 firms, the majority of whom were construction contractors and steel fabricators. The floating drydock program is therefore a civil engineering and construction story. Told here for the first time it presents the background of the program, descriptions of the various designs and accounts of the construction methods used at the 28 building yards, with detailed descriptions of representative yards building each of the several classes of drydocks.

How floating drydocks operate

The floating drydock is a buoyant vessel composed of a pontoon hull carrying upright walls, known as wingwalls, to form an open-ended

ough. It can be submerged by admitting water to compartments in the hull (and usually part way up the wingwalls) to permit floating a ship over the dock. It then can be raised by pumping the water out so that the dock rises until the ship's bottom is exposed—for examination and repair. The wingwalls serve as buoyancy compartments to prevent the drydock from going completely under water, and also support, either above the submergence level or in watertight compartments, the machinery necessary for drydock operation. On some classes of drydocks space for crew quarters, repair machinery and storage also is provided in the wingwalls, and frequently the cranes necessary for handling repairs and supplies are mounted on them.

Floating drydocks are classed as trough type when they are a continuous and rigid or semi-rigid structure, and as sectional when they are made up of separate units joined together. As compared with the graving dock, a floodable basin on shore that is a part of every permanent naval base and shipyard, the floating dock is more rapid in operation especially on vessels that are small compared with the dock capacity. The reason for this is that the graving dock must be filled with water to get the vessel in while the floating dock need be submerged only deep enough for the vessel to come aboard. The floating dock also is adaptable where foundation conditions are unsuitable for a graving dock. But the outstanding advantage of the floating drydock is that it permits a repair base to be established almost anywhere and in an unusually short time. In comparison, any disadvantages that it may have are of small moment in the naval warfare that we now are waging.

NAVY MEN IN CHARGE

Design and construction of floating drydocks for the Navy have been accomplished under the supervision of the following men of the Civil Engineer Corps, Bureau of Yards and Docks, of the Navy.

Vice-Adm. Ben Morrell (CEC) USN
Chief of the Bureau

Rear-Adm. L. B. Combs (CEC) USN
Assistant Chief of the Bureau

Capt. W. H. Smith (CEC) USN
Director
Planning and Design Department

Capt. E. H. Proger (CEC) USNR
Assistant Director
Planning and Design Department

Capt. Kirby Smith (CEC) USNR
Director
Construction Department

Capt. W. L. Richards (CEC) USN
Head-Fleet and Industrial
Facilities Division

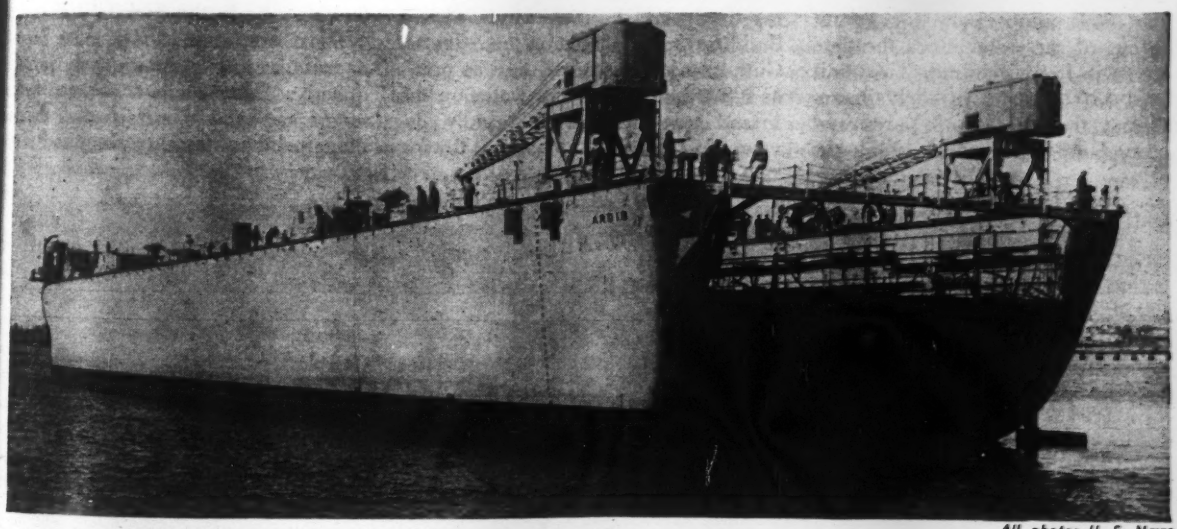
Comdr. J. T. Reside (CEC) USNR
Head
Dry Docking Facilities Section

Early history

The floating drydock is not a new idea, one of the earliest patents issued by the U. S. Patent Office being for such a device. About 1850, C. B. Stuart wrote and published a large book, *Naval Drydocks of the United States*, describing construction of graving docks at several East Coast cities and the building of floating drydocks at Philadelphia, Portsmouth and Pensacola. One floating drydock was built in the East and transported in sections by ship around South America to California.

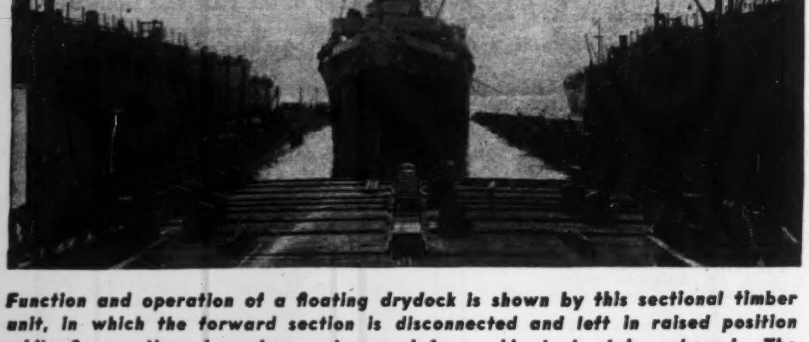
Floating drydocks did not again enjoy much popularity with the Navy until about 1900 when two 18,000-ton lifting capacity drydocks were built with the expectation of servicing the fleet assigned to the newly acquired Philippine Islands. One of the docks, the Dewey, was built in Maryland and towed to Manila in 1905-1906. This dock was used continuously up to the time that the Japs took the Cavite, P. I., naval base early in 1942, when it was sunk by retiring American forces. The other drydock also was built in Maryland, but was taken to the Algiers (New Orleans) naval base. In 1940 it was reconditioned and towed to Pearl Harbor, where it suffered damage in the December 7, 1941 attack. Soon repaired, however, it has since been doing outstanding service to keep ships of the United Nations on the sea.

The British, faced with the same problem of servicing ships far from home, built and towed a 50,000-ton capacity drydock to Singapore about 1929. It was sunk when the Singapore base was abandoned, was repaired and raised by the Japs, then again sunk recently by B-29 bombers. A 65,000-ton floating drydock also was built in England and taken to



All photos U. S. Navy

Closed basin drydock developed by the Navy Bureau of Yards and Docks. Gate at stern opens to admit a ship, then forms a closed trough. This unit has a ship-line bow and is entirely self-sufficient except that it is not self-propelled.



Function and operation of a floating drydock is shown by this sectional timber unit, in which the forward section is disconnected and left in raised position while five sections have been submerged for a ship to be taken aboard. The ship will be supported on the row of keel-blocks along the centerline and by movable bilge-blocks, like those in the foreground.

Malta where it is reported to have been damaged in some of the numerous air raids on that island.

Development of U. S. drydocks

Recognizing the importance of floating drydocks, especially units that are practically self-sufficient to go with the fighting fleet, the Navy has long planned for additional repair facilities of this type. In 1934, the Bureau of Yards and Dock designed and built a 2,200-ton lifting capacity dock of a new type with a molded bow, and a somewhat faired stern. It is equipped at the rear with a gate to be lowered to admit a ship into the trough, after which the gate is closed and the dock pumped out.

The advantage of such a drydock is that it is unnecessary to raise it high out of the water since the gate protects it from flooding. This unit proved so successful in early operation that the Bureau of Yards and Docks planned a drydock along the same lines that could dock the largest ships of our battle fleet. Bids for construction of such a vessel were taken, but they were higher than the then limited Navy budget could handle. Additional units of a smaller dock, about 3,000-ton capacity, were authorized prior to the time the U. S. was forced into the war.

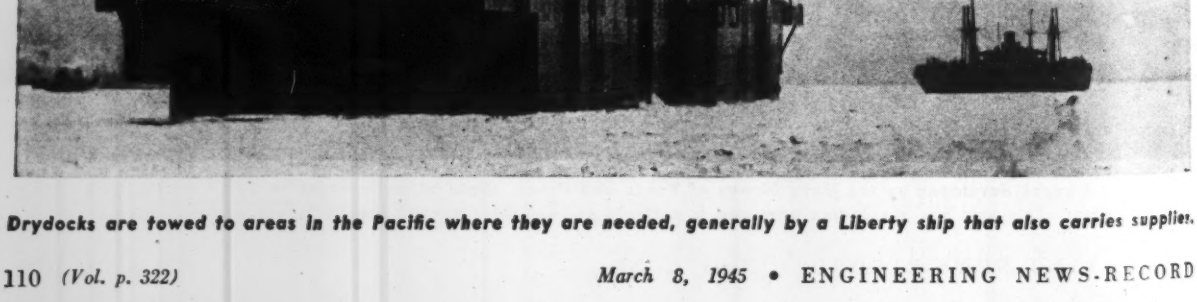
December 7, 1941, demonstrated the lack of adequate drydock facilities in the Pacific. Damaged ships had to go back to Pacific Coast shipyards, practically filling them, so that facilities were very limited for routine repair and maintenance. And to make matters worse, the drydocks at Singapore and in the Dutch East Indies were soon lost to the invading Japs. These events caused the long planned floating drydock to be rushed into action. Building yards located on the Atlantic, Gulf, and Pacific Coast, and as much as 2,000 miles from salt water on the inland waterways were rapidly developed. To avoid slow towing through submarine infested waters, some drydocks were even built in Cuba and Trinidad. All of the construction was maintained at high tempo and was substantially completed in 1944.

Outfitting for world-wide operation

Prior to the current program, floating drydocks built in this country have been primarily for commercial concerns and largely of timber, with just a square box pontoon section for buoyancy. Since all such drydocks have been intended for operation in established yards the only equipment aboard has been pumps for unwatering—other services being furnished from shore facilities. In contrast, the present construction program is largely of military docks, *i.e.*, self-sufficient units, which are able to operate by themselves away from established yards.

The different types of drydocks have widely varying requirements for services aboard. The simple yard docks require only valves and pumps to control the water for submerging and raising, plus some utility lines to carry electricity, compressed air, water and cutting gases to within easy reach of the workmen on ship repair. The full military docks, on the other hand, are as well equipped as a ship with all of its intricate controls, interlacing piping and compactly placed machinery. Diesel engines direct-connected to generators supply power for operation of the pumps and other machinery and for service to ships that may be in the dock.

Drydocks, even for advance base operation, will be moved only infrequently. Hence, it is considered better to use other vessels to tow them than to have the power required for



Drydocks are towed to areas in the Pacific where they are needed, generally by a Liberty ship that also carries supplies.

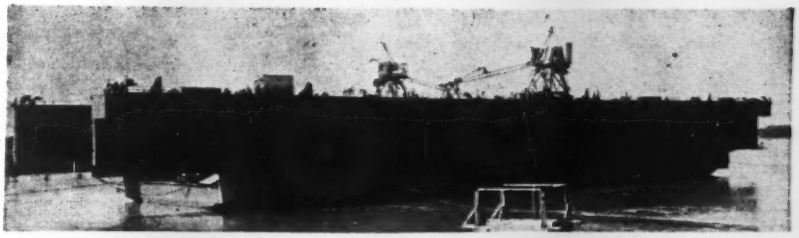
ropulsion on every dock, with the tendant high investment, continued aintenance and increased space re-uirements for machinery and larger ews. Also, during the present itical shortage of propelling equip-ent, a definite saving of time and aterial has been effected.

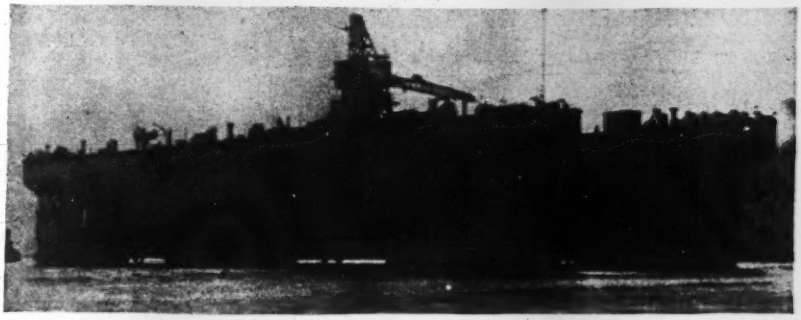
The drydocks generally are ar-nged to be operated from one cen-al control station. Water level in-icators for each compartment of the ock are brought to the central point d arranged to indicate on a dial or thermometer" scale the depth of wa-r at all times. On some of the docks l valves and all pumps are operated om this central point on a control oard, which has so many stops and witches that it is perhaps best char-cterized by the job expression "you lay it like an organ". On most docks wo-way speaker communication is rovided to each pump and valve sta-on. In some of the simpler units ontrols are operated only at the alves and pumps, following instruc-ions from the central station.

Crew bunks are the usual double- r triple-deck pipe frame, flat-spring ype arranged to fold up out of the ay. Galleys and serving tables are omplete mechanically, designed for apid preparation of food, quick serv-ng and easy cleaning.

Sun beating on the steel decks and ossible operation in far northern limates make insulation mandatory o improve living and working condi-ions, so sides and decks of the quar-ers, machinery and repair compart-ents are protected with insulating aterials. Refinements of air condi-ioning cannot be made in wartime ut good ventilation is provided. This ot only makes the quarters more liva-le but protects the dock and equip-ent from condensation and dripping hat accelerates rusting and deteriora-ion.

Floating drydocks in the current rogram have been built from mate-ials that would interfere least with he Navy's program for fighting ships, nd in most cases have been built in reas where recruiting of labor would ompete least with other phases of the ar program. Consequently, steel has een used for the largest of the float-ng drydocks and for units intended or advance base assignments. Other docks have been constructed of wood, combination of wood and steel and of concrete.





Center section (above) of 18,000-ton, three-piece drydock just after launching. This huge unit is made self-docking by use of matching but shorter end-sections, which are submerged, floated to prepared positions under the center section and pumped out to raise the center for inspection and repair. End sections can be docked by floating over submerged center section.

Operation of floating drydocks is the exacting job of specialists. Repair of ships in established commercial yards has increased so much that there have been few experienced workers to share with the Navy for the greatly increased number of Navy drydocks to be manned. Consequently, personnel for all of the floating drydocks have had to be trained from men who in many cases did not even know what a drydock was. A floating drydock school was established at Tiburon, on San Francisco Bay just north of the Golden Gate, and there hundreds of men and officers have been trained in the rudiments of drydock operation. These men are recruited generally through regular Navy channels but some of them are experienced construction men and come from the Construction Battalions, *i.e.*, the Seabees.

Classroom and visual instruction is given the trainees but most important is the actual operation of drydocks. Deep water is available at the school and small docks are permanently assigned there for operation; some minor repair work is done on small vessels by the students.

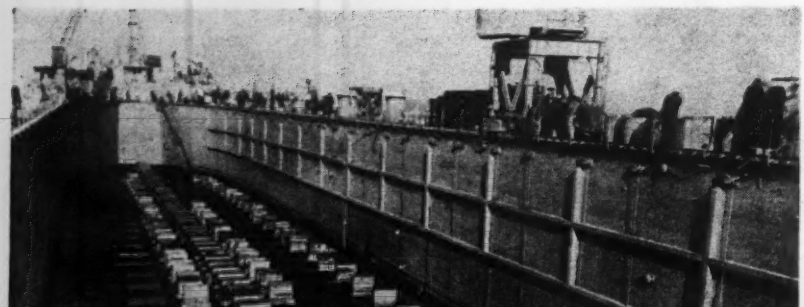
Several weeks before a drydock is completed these trained men go to the yard where the unit to which they are assigned is being built. They learn from the builders all the little kinks and absorb all the knowledge they can to help them in actual operation when the vessel is commissioned.

But when the floating drydock, or sections of the larger ones, are completed and in spick and span shape with a new Navy crew aboard, they still are far from the fighting front. Towing experiences in getting these vessels to advance position could very well fill a book in itself, as all classes of docks have been towed in all kinds of weather to all parts of the world.

Taken to all parts of Pacific

Most frequently used tow ships have been the Liberty freighters, not because they are particularly good towing vessels but because there have been more of them available than tugboats of ocean-going size. The Liberty ships also take a load of equipment and materials for use at the advance base.

Upon arrival at their destination, the smaller docks are almost immediately ready to go to work while the big sectional docks naturally require considerable time for assembly into the units required to service battleships. In establishing a work area for the big drydocks and preparing them for actual operation, it is necessary to find a well protected harbor with natural deep water and minor current effect. Throughout the Pacific and at other points on the global bat-



Trough of 3,000-ton capacity ARD (Auxiliary Repair Dock). Living quarters and machinery are in 10-ft. wide wingwalls. Repair equipment is in the wider bow end.

the front "movable bases" of floating drydocks with experienced Navy crews do regular maintenance and repair on fighting and cargo ships. Sometimes only temporary repairs are undertaken to enable a stricken vessel to reach a major naval base where complete overhaul can be expeditiously handled.

Usually, however, other than major battle or collision damage is completely repaired at the advance base docks, and the vessel is back in service in a few days. Thus time lost for repairs is kept to a minimum and the effective strength of our Navy and Merchant Marine maintained at a high level. In the advanced areas only the ships that are capable of fighting or working are counted. The floating drydocks built by the Bureau of Yards and Docks for the Bureau of Ships and manned by Navy crews are keeping ships effective more of the time and thus are shortening the road to Tokyo. Just what these floating drydocks are is discussed in the following section.

RADICALLY NEW DESIGNS

Many of these new floating drydocks are built to designs radically different from anything previously constructed. Newest and most novel are those assembled from several units, each consisting of a molded pontoon hull supporting wingwalls designed with hinges so that they can be laid flat on the pontoon deck. Known as ABSD's (Advance Base Sectional Docks) they are military type units, self-sufficient, with power for operation, crew quarters, cranes and the like.

This type of drydock was designed in two sizes—originally classified as for battleships and for cruisers. The battleship dock is made up of ten sections, each with a lifting capacity of 10,000 long tons. The ten sections, when assembled make a dock with an effective length over keel blocks of 827 ft. and a clear width between wingwalls of 140 ft.

The so-called cruiser drydocks, actually large enough to take battleships also, are similar to the battleship docks except in dimensions, and are made up of seven sections. They make a drydock about 725 ft. long, 825 ft. over outriggers, and having a total lifting capacity of about 56,000 long tons. On this dock cranes that operate on the wingwall are set back so that the top of the wingwall is unobstructed, an outside rail for the drydock cranes being supported on structural framing built up from the pontoon deck. Although aircraft carriers have a deck width in excess of 120 ft. they still can use this class dock, as the wide flight-deck is high enough to clear the top of the wingwalls.

In towing, wingwalls in an erected position present a large exposed area comparable to the canvas used on sailing vessels of earlier days. By lowering the wingwalls to horizontal position, the wind resistance is decreased to reduce difficulty of towing and maneuvering.

The wingwalls are quite large and require unusual means for lowering and raising. Original plans for manipulation of the wingwalls was to submerge the pontoon section by flooding, then by tilting and maneuvering the entire section, one wingwall was to be raised and then the other utilizing their own buoyancy. This scheme was used only on one section as a test and, while it proved entirely feasible and practical, it has been abandoned in favor of a much simpler and more rapid scheme of raising the walls with hydraulic jacks.

Now in South Pacific

Some of these huge sectional drydocks are now operating in advance areas in the Pacific. The sections have been found to tow very easily, a single Liberty-type cargo ship or a seagoing tug being used to take individual sections wherever they are wanted. The drydock units have fixed skegs, *i.e.*, rudder-like fixed protrusions at both sides at one end of the pontoon, to assist in keeping the dock in line while in motion. Properly ballasted sections are said to stay directly behind the towing ship.

A protected location, where ground swells, storms, currents, water depths and other natural conditions are properly balanced, is selected, and the seven or ten units are there assembled into a huge drydock. Wingwalls are raised on the sections individually and the units are then brought together. The wingwalls are joined into a continuous unit by rigidly welding them together, using heavy splice plates at top, sides and at the pontoon deck level.

The cranes, which operate on top of the raised wingwalls, are taken to the advance area as a deck load on one of the sections. Arriving at the location selected for operation of the dock, the crane is transferred in one piece from the deck of one section to the top of the wingwall of another section. To accomplish this, the section with the crane on the deck is pumped out so that it is relatively high in the water, and the unit to which it is to be transferred is submerged so that the wingwall is at the same height as the deck where the crane rests.

Actually, there is a lot more to it than simply lining up the rails and running the crane across. It is a neat job of balancing water ballast and of pumping or flooding compartments as the load moves. It is a job that requires knowledge of both rigging and

stability for successful accomment, but it has been done by truction men newly trained for dock work.

he sectional docks just described the advantage of being self-dockfor maintenance or repair by the ple expedient of unbolting pontoon ions from the wingwalls, submergthem slightly and floating them from under the wingwalls. They then be docked on the remaining ions just as a ship would be. is type drydock can, of course, be erated with fewer than the planned mber of sections if this should be uired, and can successfully lift any p not requiring greater length of l block support than is provided by sections available.

Three-piece yard type docks

Next in size to the steel sectional cks described are the 14,000 to 3,000-ton three-piece steel docks havg a long center section as the imary unit, but with shorter end ctions provided to make self-dockg possible. The center section is oughly 375 ft. long overall and the d sections are somewhat shorter han the approximately 90-ft. clear idth between wingwalls so that they an be turned 90 deg. and taken into e chamber of the main section for y necessary repair. These docks are esignated YFD or Yard Floating Docks.

Docking of the main center section f such a drydock is accomplished by etaching the end sections, partly submerging them and floating them to a prepared position under the end of the center unit, which is pumped out to keep it at a high elevation. Water then is pumped out of the end sections to create sufficient buoyancy to lift the entire dock, thus exposing the bottom of the center section for repair and maintenance.

Although this type of drydock generally is intended to operate when moored at a pier, most of them have been built with prime diesel power aboard for possible operation in advance areas and independent of shore facilities. Some of the docks have been assigned permanently to yards in this country where power, repair equipment and living quarters are more economically available ashore, so such facilities have not been installed on these drydocks.

A principal advantage of the three-piece floating drydock is that the long center section provides a rigid support under most of the length of the ship to be lifted. Drydocks of this class usually are large enough to dock almost any merchant ship and any fighting ships up to cruisers; and, due to the self-docking feature, can be used away from established shore facilities. When in tow, this drydock has the large area of wingwalls exposed to the wind, making movement somewhat difficult, but a number of such units have been successfully towed long distances at sea.

NAVY DESIGNATION FOR FLOATING DRYDOCKS

ABSD—Advance Base Sectional Dock
Seven or ten large sections

ABD—Advance Base Dock
One section of ABSD

ARD—Auxiliary Repair Dock
Steel—with ship-like hull

ARDC—Auxiliary Repair Dock, Concrete

AFD—Auxiliary Floating Dock
Steel—1,000 or 1,900-ton, one-piece

YFD—Yard Floating Dock

The three-piece docks vary in width from 114 to 126 ft., and so cannot be taken through the Panama Canal as a normal tow. However, the Bureau of Yards and Docks has devised a scheme, not yet divulged, for taking the wide vessels through the Canal.

Ship-shaped drydocks

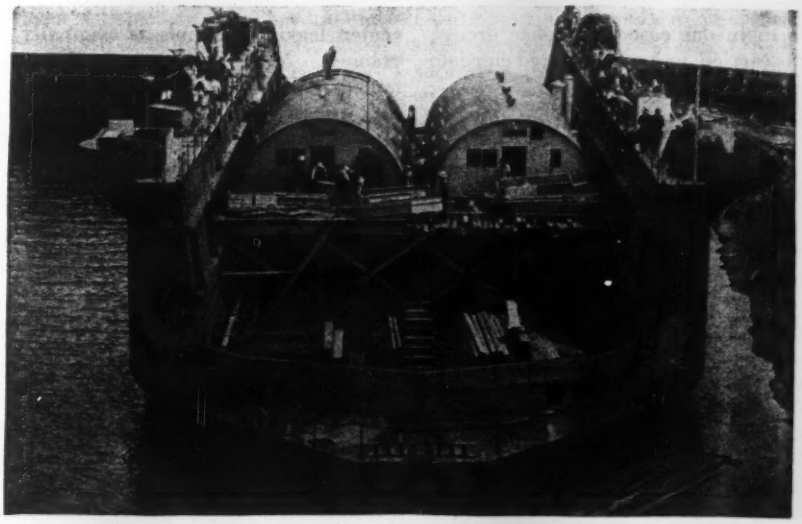
Best for maneuverability and perhaps best liked by the drydock forces afloat are the Auxiliary Repair Docks, the so-called ARD type, capable of docking destroyers, landing ships for tanks and similar crafts. These vessels are about 490 ft. overall and have a maximum width of 81 ft. The first units built have a clear width between wingwalls of 49 ft. but on later units this has been increased to 59 ft. to make possible docking wider ships in the 3,000-ton class.

Self-sufficient units

ARD's are built to ship lines, and they are complete and self-sufficient except that they do not have their own propulsion power and must be towed to the location where they are to work. They have machine and hull repair shops aboard, supplies of raw materials and quarters for a crew of about 107 officers and men. Quarters are in the upper portion of 10-ft. wide wingwalls, which form the sides of the vessel and support a full revolving gantry crane for servicing ships in the dock.

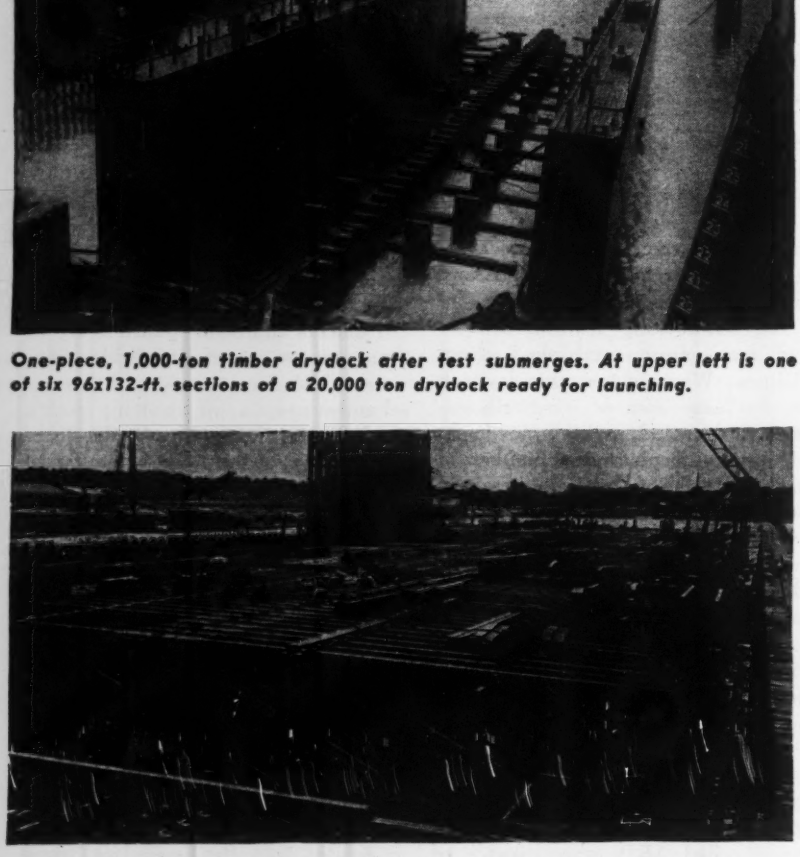
The prow of the ARD is similar to that of a ship, while the stern is faired somewhat and closed by a hinged gate to provide a protected working area inside. Drydocks of this type can, in an emergency, dock a ship while the dock itself is in tow.

The protected basin is an excellent place for transportation of cargo, and the drydock usually carries large amounts of essential freight when it is being taken to an advance base. A timber barge, fitted for woodworking and used in cutting keel block timbers as well as to assist in repair operations, is loaded into the basin for trans-



Quonset huts serve as quarters on 1,000-ton capacity AFD while it is towed to advance areas. Huts are set ashore or on barges alongside for quarters at temporary stations.

One-piece, 1,000-ton timber drydock after test submerges. At upper left is one of six 96x132-ft. sections of a 20,000 ton drydock ready for launching.



Interlacing framing of pontoon for one design of sectional timber drydock.

port. In one case a complete dredge was carried, and was repaired en route to its new destination.

Small auxiliary seagoing docks

The 1,000-ton Auxiliary Floating Dock (AFD) is a steel vessel of the one-piece trough type, intended for docking of yard and patrol craft, mine layers and sweepers and various auxiliary small ships. Planned for service in the forward areas, the pontoon body of this type dock is faired at bow and stern to facilitate towing. The docks are 200 ft. long, 64 ft. wide and have a clear width between wingwalls of about 48 ft. These docks, as originally designed, were wide enough, but too short to handle the Destroyer Escort ships so some of them have been extended, while under construction, by adding 88 ft. at the center, leaving the ends as originally planned. Most docks are self-contained, with diesel engines, generators, air compressors, evaporators and similar machines to make them independent of shore facilities.

The wingwalls are quite narrow, and practically all available space is required for machinery for operation and maintenance of the dock. Quarters for the crew are provided on a barge that is carried on the pontoon deck and then floated off to be tied alongside while the dock is in operating position. A woodworking shop is provided on the barge also. In the early part of the program Quonset type huts were provided for quarters, supported on falsework well above the deck while the dock was in tow, then taken ashore or set on barges to serve as permanent quarters.

About fifty timber floating drydocks have been built to several designs and in sizes from 20,000-ton lifting capacity down to 1,000-ton units. The larger docks are all of the sectional type while the smaller units generally are in one piece. The timber drydocks have some advantages and some disadvantages compared to steel. In general, they do not stand towing on the ocean as well but are more economical than the steel units. Also, it is not practical to carry the heavy load concentrations on timber structures that can be supported on the steel docks. For yard use in this country timber drydocks have proved entirely satisfactory, and many of the smaller units have been successfully towed to advance positions.

Operating yards favor wood pontoons because they can be maintained at a minimum of expense. Timber wingwalls, which are alternately wet and dry, require constant caulking and occasional replacements. One drydock built in the current program has sectional pontoons of timber and continuous wingwalls of steel.

Wood drydocks require loading with considerable ballast to make them sink, thus reducing the lifting capacity when a maximum size ship is to be raised. This has been overcome on some of the units by reversible pumps that quickly fill the compartment and force the drydock down, yet permit it to retain its entire buoyancy for lifting. This procedure requires that the wingwalls be kept watertight against pressure that is alternately greater on the inside and then on the outside of the planking.

Huge timber vessels

Many of the timber floating drydocks of the current program are larger than any of the Clipper ships of the days of wood and sail, and have required a great deal of ingenuity both in design and construction to provide structures that will stand the pounding and twisting involved in towing and the unequally distributed loads of fighting ships. Timber docks generally have transverse frames at 4 to 6-ft. centers; on some designs of docks these are an inverted arch shape to take advantage of greater depth at the center and consequent large buoyancy immediately under the keel of the vessel to be repaired.

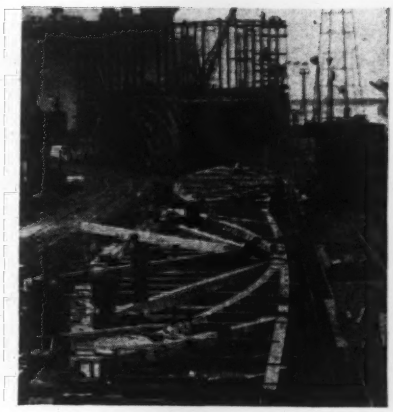
ber connectors and other modern enings have been used to good t at joints to reduce the size of bers and the number of bolts ired.

arge timber drydocks are built sections for ease in construction launching and to provide a means self-docking. Conventional prac- is to design the section a little ter (along the center line of the shed dock) than the width be- en the wingwalls so that indi- ual sections can be detached, ned 90 deg. and docked on the er sections.

Sections are connected in different s by different designers and all ear to function satisfactorily. One ign uses relatively loose "locking- s," which hold the sections in line permit minor movement in any ection. Another design employs tle and gudgeon rigid connections tween sections, thus producing a nsiderable degree of longitudinal idity. Where timber pontoons and el wingwalls are used the walls rm a continuous beam to which the ntoon sections are rigidly bolted. Most of the sectional docks are de up of six units and ordinarily ve a movable outrigger attached each of the end sections of the ydock to extend the work area. The ntoons of each section usually are vided into six compartments for ntrolled pumping, with separate mps provided for each compart- ent, although on some designs pes and valves interconnect the ater compartments to a single mp. None of the sectional timber cks have power, repair equipment quarters built into them, and gen- ally are not intended for towing to dvanced positions. Some sections ave been towed considerable dis- nces, however, and while there is me hazard to be taken into con- ideration, the loss from such towing as been relatively minor.

All of the one-piece timber dry- ocks have been conventional open- nd, trough units. Some of the arger units, about 3,000-ton capacity, ave been equipped with diesel gen- rating units, quarters for a small maintenance crew and are classed as military docks. These are heavily framed, especially well connected and are designed to be towed when and where occasion requires.

Several 1,000-ton, one-piece tim-



Arch trusses, used for most of the big sectional drydocks, were pre-assembled on rigid templates.

ber docks—200 ft. long, 64 ft. wide units—have been towed to advanced bases overseas. These docks have gone out with Quonset huts or temporary frame quarters set between the wingwalls. The wingwalls were well tied together and braced with timbers to stiffen the dock against buffeting by the sea. Like the smaller steel docks, some of the 1,000-ton units have been extended, by 72 ft. additions amidships, to accommodate 312-ft. Destroyer Escorts.

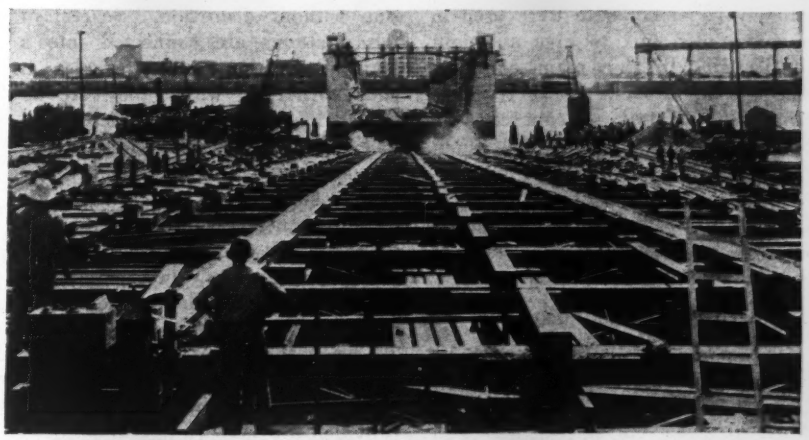
Floating drydocks of concrete

Planned originally to meet restrictions on use of steel and shortage of good lumber, several floating drydocks were built of concrete. Despite misgivings about use of an untried material the concrete units have proven satisfactory even beyond the expectation of their proponents. They can be built rapidly and economically; they have withstood towing to far places in the Pacific; and they are stable and smooth in operation, quickly winning the praise even of those definitely skeptical of adaptability of concrete. In fact, they are so well liked that it is very probable that any future expansion of floating drydock facilities will include concrete units regardless of availability of steel and timber.

Concrete floating drydocks have been built in two sizes—400-ton lifting capacity for patrol and landing craft and 2,800-ton capacity for submarines, most destroyers and LSTs. Both sizes of docks are designed to facilitate towing by moulding the pontoon to relatively simple ship lines fore and aft.

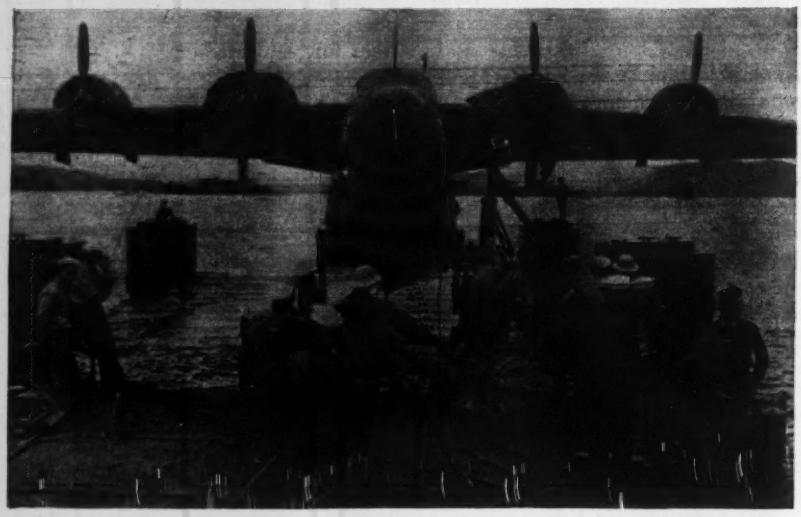
The larger concrete drydocks correspond roughly to the 3,000-ton steel ARD docks. Most of them are of the full military type with quarters aboard for a crew of 89 officers and men, diesel power and repair equipment for efficient operation in advance areas. More than the usual amount of room is available for machinery, quarters and the like as none of the space in the wingwalls is required for water compartments to sink the vessel, due to the greater dead weight of the dock itself.

Much of the difficulty encountered in concrete ship construction has been avoided in floating drydocks by making the walls and frames thick enough to readily accommodate the reinforcing steel and to permit placing the concrete without segregation. Lightweight concrete was not used since it was cheaper to build with natural aggregates and accept the



This 384-ft. long timber drydock had a measured sag of 17 in. as it reached the pivot in launching. The permanent deformation was less than 2 in., however.

A heavily loaded LST is lifted out of the water by a concrete floating drydock.



The Seabees' 5x7x5-ft. deep pontoon units are used for floating drydocks in advance areas. A tender barge carries compressors and manifolds to supply and control air pressure, and hence water movement into and out of the pontoons.

slightly greater cost of towing a larger weight on the infrequent movements of these docks.

About eight bags of cement per cubic yard of concrete were used in a well-graded mix to give a weight of 150-152 lb. for plain concrete. The 400-ton capacity docks required about 750 cu. yd. of concrete and displace, ready to operate, about 1,600 long tons. The 2,800-ton drydocks use about 3,400 cu. yd. of concrete with 800 long tons of reinforcing, and have a total displacement of 8,500 long tons.

Drydocks of small pontoons

The pontoon gear developed by the Advance Base Department of the Bureau of Yards and Docks, *ENR* April 20, 1944, vol. p. 540, has been successfully used for floating drydocks for small vessels. Individual pontoon units, 5x7 ft. in plan and 5 ft. deep, are built of heavy steel plate and reinforced internally so that they take heavy load concentration without distortion. Several of the pontoons are connected into a "string" by longitudinal angles at each corner, to which they are attached by a simple, rapid-acting device, which holds so rigidly that it provides both torsional and longitudinal strength for the entire string.

Pipe connections built into the pontoons make it possible to admit water to submerge them, the amount admitted being controlled by closing air outlets to the top of each pontoon. To raise the drydock, water is expelled from the pontoons by forcing air into them. Standard equipment provided for advance base operations facilitates setting some of the 5x7x5-ft. pontoons vertical to act as stabilizers and thus keep the drydock level while submerged. They also prevent the drydock from sinking completely under the surface.

These drydocks are operated from a tender barge, usually made from the pontoon units and attached to the docks by a hinged ramp or walkway. On the tender barge are compressors, an air manifold and control valves. Hoses lead from the tender barge to pipe mains along the sides of the drydock, and connections are made from this main to each of the pontoons that form the deck. A valve controls the air supply of each string of pontoons so that any excessive list or trim can be curbed by operating one or more of the valves.

Sizes of the floating drydocks are designated by the number of strings and the pontoons in each string. Usual sizes are as follows:

Pontoons used	4x15	6x18	6x24	6x30	7x30
Capacity in long tons.	100	250	325	400	471
Size in feet.	28x87	43x105	43x140	43x175	50x175
Number of compressors (210 cfm. at 100 psi.)	2	3	4	4	

Seaplanes, landing craft, PT and patrol boats are regular users of these smaller floating drydocks. In emergencies larger ships have been docked on the pontoon units, but now that the conventional small drydocks are at the fighting fronts it is not expected that it will again be necessary except under unusual circumstances.

Designers of the drydocks

Designs of the large steel sectional docks, the three-piece steel docks and many of the timber docks were made by Frederic R. Harris, Inc. and the firm of Construction Management, Inc., of New York. Crandall Dry Dock Engineers of Boston, Mass., designed some of the timber structures, and the Maryland Dry Dock Co. of Baltimore, Md., designed a steel dock for use in its own yard. Facilities and personnel of testing basins at Michigan and Columbia Universities and at the Navy's David W. Taylor Testing Basin at Carderock, Md. were utilized.

The Bureau of Yards and Docks designed the ARDs, the 1,900 and 1,000-ton AFDs of steel, the 1,800 and 1,000-ton timber docks, both sizes of concrete drydocks and the pontoons units.

DRYDOCK BUILDERS AND CONSTRUCTION YARDS

Methods used by 23 firms at the 28 yards where the floating drydocks described in this *Engineering News-Record Report* were built.

Chicago Bridge & Iron Co., an established firm of tank fabricators and erectors with plants at Chicago, Ill., Birmingham, Ala., and Greenville, Pa., built all classes of steel drydocks at yards on the three coasts. At Newburgh, N. Y. on the Hudson River they built 18,000-ton three-piece YFD's and 1,000-ton AFD's on side-launching ways. Description of unusual building basins at Morgan City, La. and Eureka, Calif., as well as of the C. B. & I. system of plate holding for welding will appear in the Mar. 22 issue of this journal.

Everett Pacific Co. affiliated with Pacific Car & Foundry Co. of Seattle, built at Everett, Wash. some of the large steel YFD's and several sections of the battleship and cruiser docks. The YFD's were built on a single set of side launching ways and the sectional dock units on end-launching ways, all on piles. No fabricating facilities were available in the area so the most complete steel shop in the drydock program was built, turning out 80-ton preassemblies that were handled by shipyard cranes on high gantries.

General Construction Co., Seattle, Wash., built some of the largest one-piece yard-type timber drydocks ever constructed. One 5,000-ton, 352-ft. long timber vessel was successfully towed to Alaska. Timbers were fabricated on saw lines at the site and trusses were preassembled for pontoon and wingwall frames. Assembly was done on the erection site and carried to position by a single crawler crane. The long vessels were side launched on nine timber cradles.

Puget Sound Bridge & Dredging Co. of Seattle built sectional and one-piece timber drydocks at Longview, Wash. in the timber country. Material was delivered by straddle-truck direct from mills. Erection was done on a slope of ½ in. per foot over ground ways with declivity of ¾ in. per foot. Longitudinal keelsons were laid on the supporting structure and preassembled trusses set on them by two crawler cranes. Two one-piece docks were built at one time in tandem on one set of ways, with the landward unit constructed at a higher elevation and launched after the shoreward dock.

Kaiser Co., Inc. built three-piece steel yard-type drydocks at their Vancouver, Wash. yard. Work was done under a contract from the Maritime Commission to be reimbursed by the Navy.

J. E. Haddock, Ltd., Pasadena, Calif., built first concrete floating drydock, a 400-ton unit at Olympia, Wash. Building was done in a basin scooped out of earth. Concrete was cast in place on pile supported forms, first to the 30-in. water-line, then to just below deck level and, after a shrinkage period, the deck. Forms for bottom and deck were 2x8-shiplap, interior forms were 1-in. shiplap, and exterior surfaces plywood, mostly built in place and not reused. Concrete was made with 8.4 bags of standard cement, 41 percent sand and 59 percent ¼ to ¾-in. gravel, mixed in a 2-cu. yd. Mixermobile; concrete placed at a 5 to 6-in. slump had a weight of 152 lb. per cu. ft. and 28 day strength of 6,200 psi. The Haddock firm also built 2,800-ton capacity concrete drydocks. Construction will be described in the Mar. 22 issue.

Pacific Bridge Co. built units of a sectional timber dock in basins serviced by guy derricks. Belt conveyors handled timber from storage to production saw line, the conveyor operating in a trough between raised lumber skids in the storage areas. Small timber drydocks were built on seven timber runners extending far enough inshore that a second dock could be built in tandem on the same ways. To keep the landward end of the ways low for servicing with crawler cranes, the shoreward end was depressed into a shallow basin protected by an earth berm.

Pacific Bridge Co. is the only builder of the 3,000-ton, closed-basin ARD's, whose construction will be described in the Mar. 22 issue.

Pollock-Stockton Shipbuilding Co. built units of the big sectional docks and three-piece steel YFD's. Construction, and the basins in which the drydocks were built, will be discussed in a later section of this report.

Poole & McGonigle of Seattle built sectional and one-piece timber drydocks at an unusual yard at Oakland, Calif. Dock sections were constructed on sleds that could be skidded to carry the units to a single launching way. Units were moved by steam hoists and landed on two timber cradles, counterweighted with concrete to hold the cradles down while the dock sections floated off in launching. The ways were built parallel to the shore because of the narrow channel and the docks launched down the channel rather than across it. A stabilizing truss between the two launching cradles was arranged to act as a brake by resistance to movement after it struck the water. The cradles were held by snubbing lines during launching, thus operating in a manner similar to a marine railway. The one-piece drydocks were side launched on nine packed timber cradles.

Todd-Galveston Drydocks, Inc., at Galveston, Tex., operate several drydocks constructed in the current program and built a 3,000-ton one-piece military drydock of timber. Arch trusses for the pontoons were preassembled on rigid jigs where heavy timbers were forced to required curve of arch. Locomotive cranes operating on trestles on each side of end launching ways set the arch sections over keelsons laid on pile supports. The 384-ft. long dock developed a sag of 17 in. as it went into the water, despite soft white pine "crushing blocks" used under the upper end of the vessel to relieve distortion. Permanent sag was less than 2 in.

Alabama Drydock & Shipbuilding Co. built a three-piece steel floating drydock of the YFD type on a marine railway at Mobile. The marine railway carriage was extended, widened and strengthened to accommodate the center section of the dock. The two end sections were built simultaneously on the same rig while the center section, with most of the equipment, was outfitted at the nearby pier. Fabrication and assembly followed methods used at the yard for tanker construction.

Doullut & Ewin built wood, steel and a combination of wood and steel drydocks at Mobile, using methods that will be described in the April 5 issue.

George B. Auchter worked at his home city of Jacksonville, Fla., to build several timber and steel floating drydocks in basins dug out of the sand, protected by a berm at the outshore end and dried out by wellpoints. When more building

space was required than was available along the waterfront, two basins were dug some distance back, with their bottoms at a higher elevation. After the drydocks built near the waterfront were launched and the outshore berm replaced, a shallow channel was dug to the inland basin, water pumped in to raise the level above normal tide and the drydocks from the land-locked basin floated to the waterside basin. Piles supported the concentrated load of the drydock and of the trestle craneway along side. Timbers for sectional drydock units were assembled in place but transverse and wingwall frames for the small one-piece docks were preassembled and set in one piece. AFD type steel drydocks were assembled at this yard after fabrication of steel and some preassembly by others. Carpenters used on timber drydock construction were trained to make excellent steel workers, especially welders. Radiographs were found preferable to conventional plug and coupon for testing of welds.

Tidewater Construction Corp., Norfolk, Va., built timber and concrete drydocks at Portsmouth, Va. Two sets of parallel ways were used for two units at a time for a timber sectional dock, then for one small unit. Production line precutting of timbers was used to expedite the work with roller conveyors from timber stock pile through mill and to the ways where locomotive cranes placed parts directly in position. Precutting and preboring was used throughout but preassembly was used for only pontoon and wingwall frames of a small portion of the work.

A 400-ton capacity concrete drydock was built on ways converted to side launching from facilities available. Frames for the pontoons were precast for one-half the width of the drydock and wingwall frames were precast in one piece for the full height with reinforcing protruding for welding to reinforcing in cast-in-place bottom, deck, side-shell and bulkheads. Forms were assembled in large panels for one side of the wall. For the side from which concrete was placed forms were made in lengths to fit between the precast frames and in heights of 2 ft.

Tidewater Construction Corp. took over building of several 2,800-ton capacity concrete floating drydocks (ARDC's) at Wilmington, N. C. First units were constructed in basins built parallel to shore and protected by a single line sheet-pile cofferdam braced with piles driven into mud and a tremie placed beam at the bottom. An additional basin for a single drydock was constructed later, dug into the bank. The first basin was planned to be serviced by crawler cranes on finger piers on the land side of the basin only, but later an outfitting dock was built along the outshore side to protect the cofferdam and give outside access to the basin as well. The second basin was serviced by full revolving cranes on wide-gage track.

Concrete with 8.4 bags of cement, natural aggregate, of which sand constituted 41 percent, was used with an admixture of ½ lb. per bag of cement to densify the concrete and retard the initial set. Concrete was truck-mixed for a minimum of 7 min. Shop-built plywood forms in large panels were found best to meet the shape requirements of the hull.

Tuller Construction Co., of Red Bank, N. J., dressed all lumber on the site and built units of sectional drydocks in tandem on sloping ways at Curtis Bay, Md. A minimum of equipment was used but this included a timber sizer on which rough lumber was dressed, included outgaging for caulking, in a single pass. Wingwall frames were preassembled and dip treated with chlorinated phenol but all other timbers were assembled in place on the ways.

Dravo Corporation of Pittsburgh constructed a six-pontoon continuous wingwall steel floating drydock. Fabrication was done at Pittsburgh with shipment by rail to a deep water assembly yard at Wilmington, Del. Pontoon sections, with portions of the wingwalls, were erected on a production line that moved riverward where units were turned downward for launch (*Trans. Soc. Naval Architects and Marine Engineers*, Vol. 50, 1942, p. 108). Sleds carried individual sections down sloping ways. Units were taken to Wilmington municipal pier for completion and outfitting, then the completed dock was towed to Baltimore via the Chesapeake and Delaware Canal.

Underpinning & Foundation Co. of New York built timber drydocks at Perth Amboy, N. J., altering bins of an abandoned brick yard site for warehouse and work space. Trusses for pontoons and wings were preassembled and set by crawler cranes; for one-piece drydocks the pontoon and wingwall trusses were preassembled into single U-units and set by an erection derrick mounted on wide-gage rails.

Foundation Co., New York, handled 10,000,000 fbm. in eleven months in building sections for timber drydocks at Kearney, N. J. Sections were built one at a time on each of two ways from preassembled trusses carried and set by a single movement of a locomotive crane. Launching was done as soon as the pontoon would float, a small derrick being erected on the pontoon deck for handling timbers to the wingwalls. Building one-piece steel drydocks on the same ways was complicated by the fact that the steel units were much longer and required considerable extension of the ways, high blocking at the outshore end and use of built-up cradles for launching. Chains from "ship stores" were dragged by the steel docks to dampen speed in launching.

Ira S. Bushey & Sons, veteran ship repairers, built several types of floating drydocks, all of timber. Ways were built for construction of long one-piece drydocks but units of sectional docks were subsequently built on the same ways by constructing them transversely with the ways and side launching individual sections. Locomotive cranes serviced the yard and new outfitting piers. Preassembly was used only on small one-piece docks, for most of the work timbers were partly precut and put together on the ways. Launching was done by "packing" timber cradles on the ground ways and driving up wedges to take the load.

Pittsburgh-Des Moines Steel Co. built steel floating drydocks on an inland river, developing some unusual methods that will be described in Part III of this article to be published in the April 5 issue.

Quincy Barge Builders, the combined firms of Bates & Rogers, Mississippi Structural Steel Co. and Stupp Bros. Bridge & Iron Co., built one-piece steel drydocks at Quincy, Ill. Their methods will be described in the concluding article in this series in the April 5 issue.

James Stewart Company Associates, (the associated New York firms of James Stewart & Co.; H. J. Deutchbein Co., Inc., and Peter M. Connolly Co., contractors for Navy advance base at Trinidad, B.W.I.) built timber drydocks at Trinidad to avoid slow towing through dangerous waters. Local labor was used, mostly inexperienced and slower than U. S. workers, but adaptable. Materials and equipment were transported from the United States, and construction was done in a basin.

Frederick Snare Corp. using only two or three supervisors from the United States, built a large one-piece timber drydock at the naval base on Guantanamo Bay, Cuba. Material and equipment for the dock was transported from the U. S. and construction was done in the basin excavated from a coral swamp. The basin was shaped by wood and timber sheet piling; bearing piles were used for support of the units under construction. Trusses were preassembled after the Cuban carpenter foreman made a model to show native workers the process and the product.

Surplus Property Act Inconsistencies

F. Salditt
Vice-President, Harnischfeger Corporation Milwaukee, Wis.

***itor's Note**—Manufacturers, distributors, contractors and other users of nstruction equipment all have a stake in the disposition of surplus construc- machinery, for unless the disposition is orderly the result might mean nomic chaos to the industry. In the following article, Mr. Salditt, a nufacturer, analyzes the Surplus Property Act, under which the equipment to be disposed, and notes numerous inconsistencies and weaknesses. As se weaknesses permit two or more interpretations of certain provisions, fectiveness and equity in administering the act depend upon the interpre- ions made. Mr. Salditt deplores the lack of industry advisory committees, ose presence would do much to inform the political top board as to indus- practices and needs. His suggestion as to formation of such committees, en though not specifically provided for in the act, deserves consideration.*

XAMINATION of the Surplus Property ct of 1944, the guide for disposal of cess and unwanted government- ned war materials and equipment, veals several inconsistencies and merous vague sections, especially as parts of the act that apply to con- uction equipment. For example, the t calls for aid to free private enter- ise, yet gives governmental agencies reference in obtaining equipment to e extent they might do all their own nstruction work. Avoidance of un- ntrolled dumping is listed as an ob- ctive, but prompt disposal is essed, without provisions for cor- lating these opposed principles. A erious weakness in the act is failure establish industry advisory com- ittees to work with the administra- ve board. Such committees proved nvaluable to the WPB.

The following comments are con- ned to those parts of the act affecting e construction machinery industry. o doubt other industries are simi- rly affected.

A major objective (Sec. 2-b) is "to ive maximum aid in the re-establish- ent of a peacetime economy of free ndependent private enterprise—and o stimulate full employment." Subse- uent sections appear to be incon- istent with this objective.

Another objective (Sec. 2-h) is "to ssure the sale of surplus property in such quantities and on such terms as will discourage disposal to speculators or for speculative purposes." It will be well to remember the latter objective in connection with provisions for disposal of surplus equipment to governmental agencies.

Development of foreign markets by orderly disposition of surplus equipment in other countries and avoidance of dislocation of the domestic economy of international economic relations are listed as objectives under Sec. 2-i and 2-j. These provisions evidently preclude indiscriminate dumping in foreign markets where such action would affect the domestic economy of American manufacturers formerly enjoying foreign trade with these countries.

Prompt disposal of surplus property at fair prices to the consumer, with due regard for the protection of free markets and competitive prices from dislocation resulting from uncontrolled dumping, and prompt disposition without fostering monopoly or unduly disturbing the economy or encouraging hoarding, are objectives listed in Sec. 2-m and 2-r. Again provisions relating to disposal to governmental agencies seem to be in conflict with these objectives. Uncontrolled dumping can be avoided only by controlled sales. To prevent dislocation of domestic economy, it would be well to have the emphasis on prevention of uncontrolled dumping rather than on achievement of prompt disposal. As these objectives are now written they could be interpreted as preferring prompt disposal with resulting dislocation of foreign or domestic economy.

The government is to obtain, as nearly as possible, a fair value for surplus property, according to Sec. 2-t of the act. What constitutes fair value is difficult to determine at times, and the conferees in discussing the compromise bill remarked "fair value, must of course, be determined with reference to the character of disposition, such as wholesale, as contemplated by the objective to utilize commercial channels of distribution, as well as all other appropriate factors."

Advisory committees needed

In Sec. 4 the statement is made that "surplus property shall be disposed of to such extent, at such times, in such areas, by such agencies, at such prices, upon such terms and conditions, and in such manner, as may be prescribed in or pursuant to this act." Inasmuch as the administration of the act has been delegated to a board of three members, in accordance with Sec. 6, it appears essential that the board be advised in detail as to the manner in which specific surplus property should be disposed in specific industries, such as construction machinery. The act, unfortunately, makes no provision for industry advisory committees, though both the original House and Senate bills contained such provision. It might be well to determine why it was omitted in the final compromise bill. These committees could well advise the board as to extent of disposition during given periods of time, pricing, geographical needs and distribution, proper channels of trade to be utilized, and many more questions that only those connected with an industry are familiar with.

The board is authorized by Sec. 9-a and Sec. 9-b to "prescribe regula-

tions to effectuate the provisions of this act and in formulating such regulations the board shall be guided by the objectives of this act." Furthermore, such regulations may or may not stipulate rate of disposition, prices, terms and other provisions for disposal of surplus equipment. Industry should have a voice in drafting these regulations. Mere drafting of general resolutions is not sufficient; instead, industry should work out detailed plans compatible with the objectives of the act that fall within its provisions and at the same time are equitable to all parties involved—government, industry and the public.

Utilization by federal agencies

The act emphasizes in Sec. 12-a that it is the "duty of the board to facilitate the transfer of surplus property from one government agency to other government agencies for their use." As the act does not define "use," it might mean for repair and maintenance, or perhaps for wholesale construction work. If acquiring a large amount of surplus equipment results in government agencies performing their own construction on a large scale, then the objective of re-establishing a peacetime economy of free independent private enterprise (in this case contracting) certainly would not be attained.

Governmental agencies need not purchase through regular channels of trade, for Sec. 12-b stipulates that it is their responsibility "in order to avoid making purchases through commercial channels, continuously to consult records of surplus property established by the board and to determine whether their requirements can be satisfied out of such surplus property." Also, the board is responsible for determining whether government agencies are acquiring surplus property to the fullest possible extent, and to notify such agencies whenever, in its judgment, they are not so doing. Thus, the board is directed to virtually force equipment on federal agencies, thereby encouraging hoarding. Such action would be opposed to one of the objectives of the act.

An encouraging note in Sec. 12 stipulates that "it shall also be the responsibility of the head of each government agency to submit to the board such estimates of the needs of the agency—to promote the fullest utilization of surplus property." Furthermore, all property must be transferred to the acquiring agency at the fair value as established by the board. The first requirement, as to estimates of needs, should be made mandatory in the case of construction equipment, and in reviewing such estimates the board should restrict transfers to only that equipment needed for normal activities of the agency. Also, the estimates should be limited to requirements for a relatively short period of time, say three years.

As federal agencies must purchase surplus equipment at fair value, according to the above provisions, they can acquire such property only if they have appropriations available to pay for it. Thus, in addition to the check of demonstration of a legitimate need for the property, a further check is possible through appropriation committees of Congress.

Disposal to local governments

The board shall prescribe regulations for the disposition of surplus property to states and their political subdivisions, according to Sec. 13, and "in formulating such regulations the board shall be guided by the objectives of this act." Again it becomes necessary for affected industries to work in close cooperation with the board in the formulation of regulations to avoid the possibility of stockpiling of equipment by local governments and the use of such equipment for purposes inconsistent with one of the major objectives of the act, that referring to free independent private enterprise. The act also makes it possible for state governments to rent surplus equipment, as disposition by rental is definitely provided for under Sec. 15-a.

Surplus property can be obtained by local governmental institutions, as well as non-profit or tax-supported educational institutions in order to "fulfill, in the public interest, their legitimate needs." Certainly it is in the interest of the public that local governments and institutions purchase only such equipment as they need for their legitimate purposes at established prices, whether they elect to obtain such surplus equipment from the board or through private manufacturers or distributors. Again, it is up to the construction industry to demonstrate to the board that such an approach is definitely necessary to safeguard public interest, that requests for equipment are [illegible]timate, and the property is not [illegible]quired for other than normal work. Under Sec. 13 the board may donate surplus equipment to state or local governments the equipment "has no commercial value or when the cost of its care and handling and disposition would exceed the estimated proceeds." It appears to be very necessary to aid government in establishing the method of determining as to what is commercial value, as otherwise it is entirely possible that donations may take place with respect to equipment in serviceable condition having a value higher than scrap.

Methods of disposition

According to Sec. 15-a the board may dispose of surplus "property by sale, exchange, lease or transfer, for cash, credit or other property, with or without warranty, and upon such other terms and conditions as the agency deems proper." Under such terms the board can extend to purchasers all the financial services that heretofore only private industry has been able to extend. As Sec. 2 states one of the objectives is to "utilize normal channels of trade and commerce," it should be pointed out to the board that if normal channels of trade could extend these services at the same, or at a lower cost, than can the government, and in addition can render services that the government can not extend, that at all times private channels should be utilized.

The method of selling is left entirely to the board, for Sec. 29 provides that "surplus property disposals may be made without regard to any provision in existing law for competitive bidding, unless the board shall determine that disposal by competitive bid will, in a given case, better effectuate the policy of the act." Under such provision negotiated sales are definitely possible, and as a matter of fact are invited.

It is recommended that industry, without further delay, propose detailed plans for the distribution of war surpluses of the type manufactured by respective industries; see to it that these plans are compatible with the law; and submit these plans to the board for consideration. It is also recommended that industry advisory committees be proposed to the board to work with it continuously in the disposition of surplus equipment.

1. The spillway at Bonneville Dam on the Columbia River is required to discharge large flows for long periods.

Bonneville Dam Concrete After Six Years

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***ontents in Brief**—Examination of the portland-puzzolan concrete in Bonne-lle Dam after six years of service indicates that the present condition of the perstructure surface is approximately the same as at the end of construction. cal zones where severe erosion has occurred have been repaired and now e under close observation. At the bases of all piers just down-stream from e gate slots and on the curved overflow sections adjacent to the piers, attri-on made it necessary to armor the concrete surface with ½-in. steel plates, me of which in turn were torn away and had to be replaced. The interior the concrete mass appears to be in a satisfactory condition.*

planning the construction of the ain spillway dam across the Colum-a River on the Bonneville project, lection of the most suitable type cement was one of the problems of unusual nature encountered. It as solved, after a comprehensive ries of tests in which cements were mpared by heat of hydration, water in and permeability, in favor of rtland-puzzolan cement (*ENR*, Feb. , 1937, p. 219), because it was be-ved that a special, low-heat cement as necessary to achieve the best re-lts.

Since the puzzolanic concrete has been in service over six years, during which time it has been under close observation, an appraisal of its performance to date should contain important engineering information on dams.

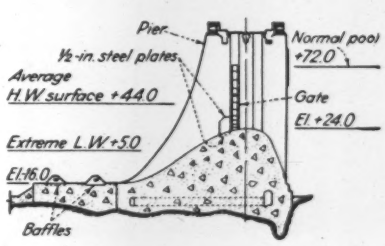

Fig. 2. Typical cross section of Bonneville spillway dam.

The spillway dam on the Bonneville project differs from other large concrete dams in that the ratio of height to width of base is relatively low (*ENR*, Nov. 1, 1934, p. 547). Vertical lift gates extend the entire length, resulting in a mass section somewhat trapezoidal in shape between piers (Fig. 2). The spillway section consists of blocks separated by construction joints which were grouted after cooling had largely taken place. Each block is about 140 ft. long transverse to the axis and was built in 5-ft. lifts without mechanical cooling. Considering the behavior of this mass of concrete fully as important as that of the surfaces exposed to erosive action of water, selection of the cement was based on the decision to build the blocks rapidly without vertical joints parallel to the axis, in order to avoid cracks in this direction that might endanger the integrity of the structure.

A portland cement of modified composition was used with which was

Mixes Used in Bonneville Dam

Mix	Total Pozzolanic Cement Content Bbls. per cu. yd. Concrete	Actual Portland Cement Content Bbls. per cu. yd. Concrete	Where used
1	0.90	0.675	Mass concrete
2	1.00	0.750	Mass concrete
3	1.45	1.087	Surface of spillway subject to overflow

ground 25 percent calcined puzzolanic material. Thus, for each barrel of puzzolanic cement used, only 75 percent of the contents were portland cement ingredients. The addition of puzzolanic material did produce a small additional compressive strength in the concrete over a long period but, in general, compressive strength was sacrificed for low heat rise of the mass structure. Some of the mixes used and the cement content per cubic yard of concrete are indicated in the accompanying table.

Erosion during construction

During construction, the entire flow of the river was diverted over the surface of a partly completed section of the structure and caused erosion of concrete in certain zones, which were largely repaired during the final stages of construction and which will not be discussed here. Also, certain horizontal surfaces were weathered in areas, especially on the baffle deck below the overflow section, where foot traffic during construction was severe. Some weathering of such areas can undoubtedly be attributed to temperature changes, since the construction at Bonneville was subject to alternate freezing and thawing during winter months. These areas were also repaired during final stages of construction and may account for the irregular erosion now existing on the baffle deck.

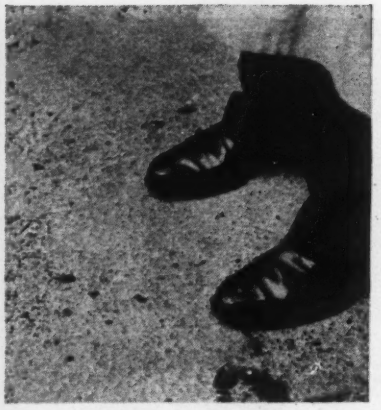

Fig. 3. Area visible at present on the surface of the spillway near its lip appears slightly worn, but still presents a fairly smooth, uniform surface.

The condition of all concrete will be classified under the following heads:

1. Above water concrete surfaces of superstructures, including fishways.
2. Special local zones where severe erosion has taken place.
3. Underwater concrete surfaces of overflow sections, spillway decks and baffle blocks.

Little change in superstructure

The present condition of concrete surfaces of the superstructure is approximately the same as at the end of construction (Fig. 3). A few minor exceptions may be noted, but nothing that can be said to reflect adversely on the concrete. During icing periods, salts have been used on one bridge deck, resulting in some consequent surface scaling.

Attrition severe near gate

Local zones where severe attrition has occurred are above water at the low water stage and have been repaired and closely observed. One of these is at the bases of all piers just downstream from the gate slots where severe erosion occurred in the first year's operation, necessitating repairs. Each season thereafter, these areas have been repaired with concrete of different brands of cement and utilizing a number of admixtures, such as are used for floor hardeners. There has been no apparent difference in the time required for the erosion of any of the materials used, from which it has been concluded that concrete is not suitable for surfacing these localized areas.

Therefore, ½-in. steel plates were installed on the faces of piers at these locations (Fig. 4). They were welded to the armoring of the gate slots and extend downstream about 5 ft., a distance sufficient to cover all areas of intensive erosion.

Similar regions of erosion existing on the curved overflow sections adjacent to the piers and extending outward from the piers about 2 ft. immediately adjacent to the gate slots were also repaired with steel plates.

In many cases the vertical plates

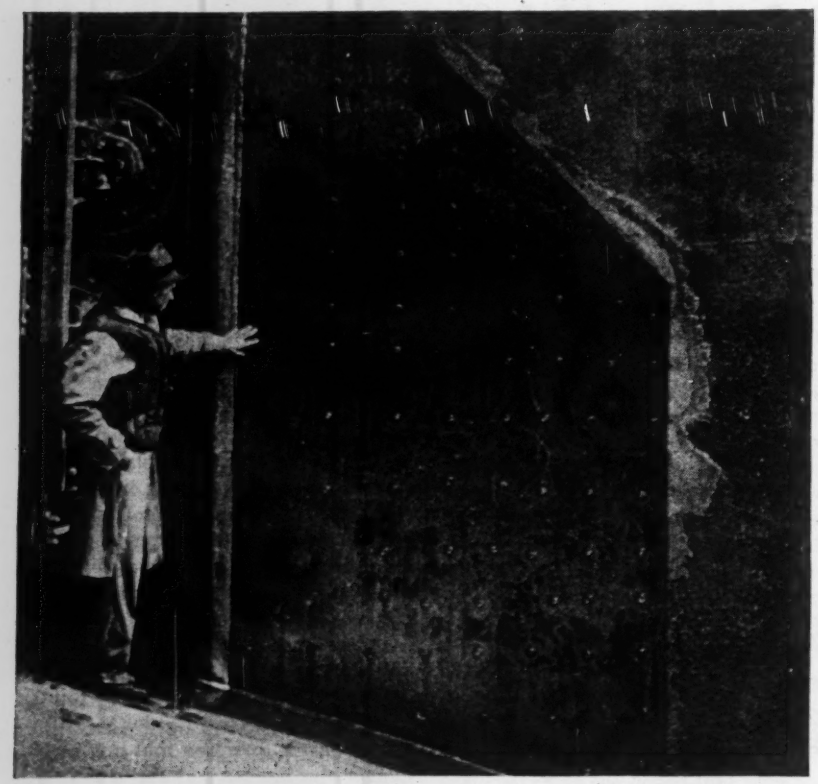

Fig. 4. Steel plates ½-in. thick were set into vertical faces of spillway piers just below gate slots to resist wear. In many cases plates were torn off by the water.

g. 5. No serious attrition of the vertical concrete surface has occurred except close to the disturbing slot. As evi-ace of this, note the vertical form mark (left) on the surface just downstream from eroded section on right, where e ½-in. plate has been partly torn away and concrete behind it seriously eroded.

ve since been torn away by the ormous force of the water (Fig. 5). one case a localized area of plate ill in place has a spongy appearance a depth of about a quarter of an ch that is plainly the result of cavi-tion of an unusual kind. It has been ecided that it is useless to attempt maintain these local surfaces with ything except steel, and from the xperience gained to date it will be ossible to maintain these surfaces in satisfactory manner without exces-ive cost. It is possible that 1-in. lates on the face of the pier and on he spillway surface will result in con-inued satisfactory service, if they can e adequately anchored to the con-rete.

The surfaces of the concrete piers and spillway adjacent to the plate show no unusual wear; in fact, form marks are still plainly visible and roughened surfaces occur only where overflow action of the water is greatest. (Fig. 5)

Local erosion near baffles

The third classification of eroded concrete is represented by areas adjacent to baffles on the deck (El. -16.0), a typical plan of which is shown in Fig. 6. Existing in varying degrees in all 18 bays of the spillway, the erosion is localized on the vertical face of the triangular baffles and on the horizontal deck in almost uniform relation to the baffles; *i.e.*, the downstream corners of the upstream row of baffles.

As to why some of these eroded areas are a few inches deep and others more, no explanation is offered. It is unlikely that concrete of any cement content or mixture would fully withstand this severe condition. On the other hand, the condition is not such that it would appear necessary to attempt repairs with any material other than concrete. Underwater surveys have been made of these areas, at intervals of two to three years, the results of which indicate progressive action but of diminishing acceleration.

Again referring to Fig. 6, the flat deck between baffles is eroded 32 in. deep at one localized area near the center of the dam where the greatest amount of water is released through

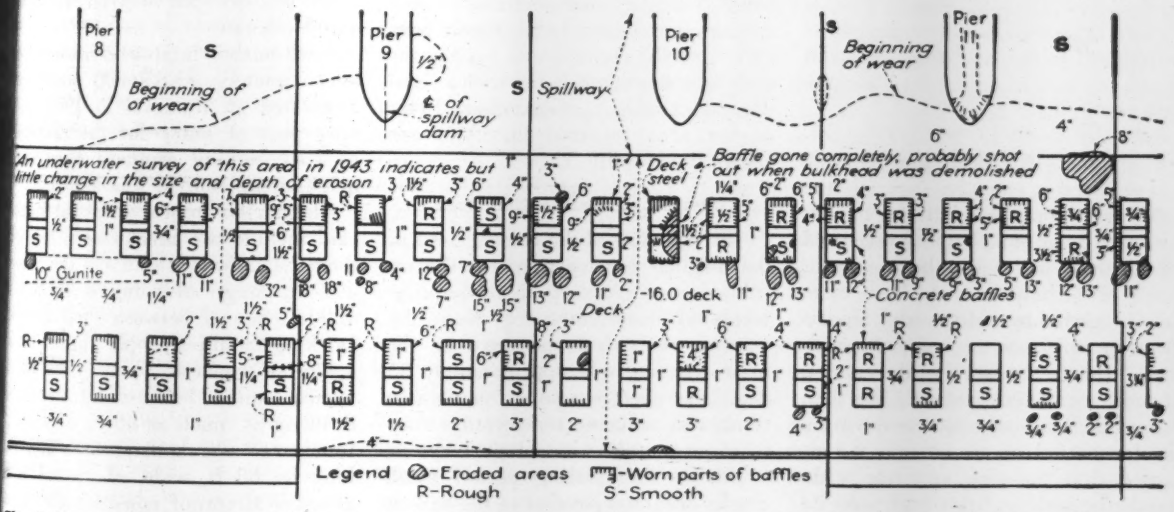

Fig. 6. Plan of spillway and baffle deck at -16.0, showing scour as of January, 1939. Erosion is localized on the downstream corners of the upstream row of baffles.

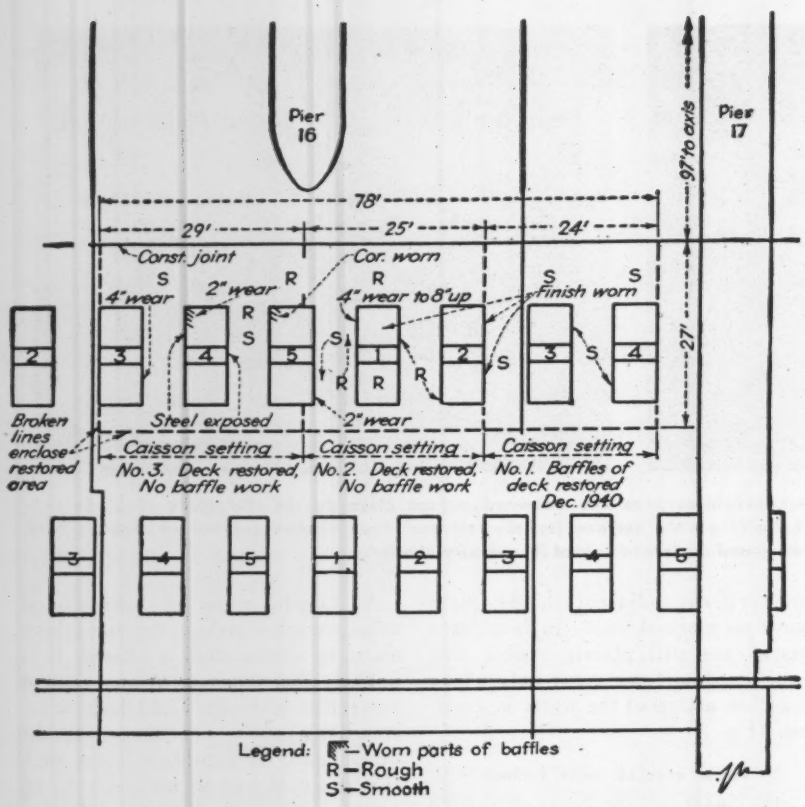

Fig. 7. Plan indicating conditions in September, 1943, of portion of baffle deck restored in December, 1940. Presumably, the portland cement concrete used in repairs withstands the action of high velocity water somewhat better than the puzzolanic concrete.

the gated openings. At all other bays, the depth ranges to 18 in. The thickness of concrete in this area is about 20 ft. It is believed that this condition is not serious and that it will not require anything more than renewal of the surface with dense concrete at intervals of 15 to 20 years. This is a more favorable condition than was anticipated by the designing staff and board of consultants at the time the dam was built.

In 1940, using an unwatering cofferdam, the -16.0 deck was exposed and repaired in one bay. Not only the areas described above but also the flat deck was repaired. Repairs consisted of concrete using standard cement. These areas have recently been carefully inspected by a diver who reports the new surfaces as being "roughened." Due to the fact that the erosion of new concrete is apparently less than that of the original concrete during a similar period of use, it may be assumed that the new concrete withstands the action of this high velocity water somewhat better than the concrete made with puzzolanic cement.

The actual portland cement content of the original concrete was 1.087 bbl. per cubic yard, whereas the content of the concrete used in repairs was 1.4 bbl. per cubic yard. If 1.87 bbl. of puzzolanic cement per cubic yard had been used originally, it would have resulted in the same portland cement content as was used in the repair concrete, and the result would have probably been more nearly the same. Conditions existing in September, 1943, in the area repaired in 1940, are shown in plan, Fig. 7.

Interior of mass satisfactory

The selection of the cement used in the original construction was the result of consideration of all requirements of mass concrete. Since the average rise of temperature of the mass concrete was approximately 35 deg., the effectiveness of puzzolanic cement in reducing temperature rises in large masses was satisfactory.

During the cooling period small cracks occurred parallel to the axis at about the third points of the length. Two spillway section blocks especially exhibited such cracks where cut by transverse inspection tunnels. A small amount of leakage which occurred at one of these cracks for a year or more has now entirely ceased. In fact, while evidences of cracks still exist, all have been completely healed and are not now considered objectionable.

The condition of this concrete at present is excellent. Dampness exists on the walls of the inspection tunnels at certain places, but at no place can it be said that water is flowing through the mass concrete. In every other way, the interior of the mass appears to be entirely satisfactory.

Peru Builds Railway to Link Coast with Interior

A 40-mile railroad now being constructed at a cost of $525,000 between the Pacific seaport of Matarani and La Joya, on the main lines of the Southern Railways of Peru, is expected to make an important contribution to trade and travel in the southern part of the Republic by linking Matarani's modern port facilities with the interior of the country.

The first section of the new line to span the twelve miles between La Joya and Quebrado Guerrero, is scheduled for completion by the end of February, 1945, with construction of the balance of the line and opening of Matarani to traffic planned for the end of the year. Present plans call for abandonment of the former main line between La Joya and Mollendo, on the coast about nine miles south of Matarani, and the building of an additional rail spur between Matarani and Mollendo.

Until harbor improvements costing approximately $1,050,000 were inaugurated at Matarani in 1941, the only port of entry for the railroad network serving southern Peru and neighboring Bolivia was Mollendo.

The harbor improvements at Matarani include two breakwaters, one of them 2,122 ft. in length and the other 492 ft. long, affording a sheltered 460-ft. channel between their heads. Docking facilities proper consist of a 1,476-ft. concrete and rock-filled wharf, suited for use by steamers drawing as much as 36 ft. of water; four large warehouses, each 282 ft. long by 88 ft. wide, of cement and asbestos fireproof construction on a steel frame, and customs, baggage, administrative and waiting rooms.

Safeguards for Water Supply Stress Cross-Connection Elimination

Problems associated with cross nnections and back-siphonage con-tions in water supply systems are ny during peacetime; but during rtime these problems are multi-ed many fold. This is especially e with the present large and rapid dustrial expansion and the tre-ndous development in land and sea nsportation for military purposes. A brief review of prevailing condi-ns and the recommendations for minating dangers to users of pota-water supply, contained in a report t released by the Committee on nitary Engineering of the National search Council, are of interest.

Besides recommending steps to be ken to protect back-flow connec-ns between potable and non-potable ter supplies, and between potable ter supplies and sewers or drains, e report recommends that personnel signed to operating water supply nnections and equipment should be equately instructed and supervised. his personnel, says the report, ould be furnished a clear statement to duties and responsibilities with spect to the protection and safety the water supply.

Further recommendations are that ery connection with a plumbing sys-m which will permit back siphoning ould be eliminated when possible, herwise it should be provided with approved type of vacuum breaker. inting, posting or otherwise mark-g the various pipes for potable and on-potable water, such as in indus-ial plants, or on vessels or docks, ould be such as to make them adily distinguishable. Where pos-ible, all outlets of non-potable water-es should be made unavailable for rinking, and shore connections into hich fire boats may pump should ave distribution systems separate om systems carrying potable water.

In addition, during the war emer-ency the shore users near pierhead nnections should be afforded pro-ction by approved backflow pre-enters at or near the property line n domestic and firelines carrying otable water. Back-flow preventive evices should also be installed at ach shipside outlet, whether for domestic or fire water service.

Likewise, all cross-connections between potable and non-potable water supply lines on vessels should be broken and so maintained. If in an extreme emergency a cross-connection is made on a vessel, immediate steps should be taken to notify all persons against use of unboiled water and all contaminated pipes and tanks should be disinfected after the emergency cross-connection has been broken. Supervisory medical officers or health authorities should be notified of the cross-connection.

Double check valves are inferior to backflow preventers which operate under pressure, despite the fact that such valves have been used successfully on many old installations.

The need for careful installation of backflow preventive devices to avoid introduction of contamination by the devices themselves is stressed.

Also recommended is cooperation of local water, health and building departments in the establishment of a coordinated program to investigate and correct existing dangers from backflow and to control new installations of water and plumbing systems in buildings. Establishment of a unified national program by the appropriate federal agencies is urged, as is establishment of needed training courses for personnel responsible for water supply operations.

The report was prepared for the National Research Council's committee on sanitary engineering, of which Abel Wolman, consulting engineer of Baltimore, Md., is chairman, by a temporary subcommittee on cross-connections. Sub-committee members are: E. Sherman Chase, consulting engineer, Boston, Mass.; Joel I. Connolly, assistant to the president of the Chicago Board of Health; Francis M. Dawson, dean of the College of Engineering, University of Iowa; Raymond F. Goudey, sanitary engineer, Los Angeles, Calif.; and Sol Pincus, sanitary engineer, New York City. Warren J. Scott, director of the Bureau of Sanitary Engineering, Connecticut State Dept. of Health, Hartford, is chairman.

Copies of the report may be had by addressing the National Research Council, 2101 Constitution Ave., Washington, D. C., requesting "Sanitary Engineering Report No. 8".

Algae in Cleveland Water Requires Much Carbon

An unusually protracted period of warm, clear weather in the Great Lakes region last autumn aggravated Cleveland's recurrent problem of algae in the lake water supply and required heavy dosages of activated carbon to combat disagreeable odors. George W. Hamlin, Cleveland water commissioner, states his department was obliged to use from 16 to 83 lb. of activated carbon per million gallons of water to remedy conditions. This treatment has reduced complaints of a disagreeable earthy taste and odor, although the latter have not been entirely removed.

The microscopic vegetation which infests the water of Central Lake Erie has not been specifically identified among the scores of types of such algae which have been classified. Appearance of the algae in the fall coincides with the drop in the temperatures of Lake Erie from its high of around 73 deg. in late August to the low 50's in early November.

Tests have been made in Cleveland of the effects of activated carbon introduced at various points of flow. Application at the influent to the filters has been judged to be more effective than at the entrance of the raw water to the settling basin. It is believed that absorption of the oils which impart the odor and taste is apparently more effective during a brief contact period than in the two to four hours of contact in the settling basin. Cleveland uses suspension feed equipment.

In addition to the complaints of householders, the algae contamination has created a problem for food industries, particularly breweries. The latter were forced to boil water to insure full yield from their yeast and to avoid harsh and unfamiliar tastes in their product.

Highlights of State and Municipal Postwar Planning Progress

Public works and industrial development were among programs receiving major attention of state planning agencies during the last year, the American Society of Planning Officials reports in a recent review.

Highlights of the year include: Emergence of a trend, started by New York in 1943 with an appropriation of $3,000,000, of state aid to local public works blueprinting; increasing opinion among state planning agencies that postwar employment will be too acute to be solved through any public works program; and creation of three new state planning agencies —the Nebraska Development Commission, Kentucky Postwar Advisory Planning Commission and New Jersey Department of Economic Development, into which was incorporated the old New Jersey Planning Board.

Following the lead of New York, four states appropriated funds to aid their local governments in planning postwar public works projects: California provided $10,000,000, Michigan $5,000,000, and Maryland and New Jersey $500,000 each. Legislation calling for similar state aid to municipal governments is scheduled for submission to many of the 44 state legislatures convening this year.

Postwar unemployment problem

State planning agencies sponsoring programs for accelerated industrial and manufacturing activity are responsible for the opinion that public works programs cannot be counted on to solve postwar unemployment. The director of Maryland's commission on postwar reconstruction and development estimates that it will be necessary to find jobs for 370,000 probable unemployed in the first postwar year. The director reports that "if all blueprints on public works projects are complete and ready for construction the minute hostilities cease, employment for only 21,000 people, on and off site, could be provided.

With its population increased by 1,500,000 in a little less than four years, California through its state reconstruction and reemployment committee estimates that work for 9,000,000 persons by 1950 will be necessary to insure a productive economy.

The Illinois Postwar Planning Commission has nearly completed an inventory of the state's resources and a state program for education, health and recreation.

A wide variety of services are being furnished by various state planning commissions. For instance, Michigan's planning commission is investigating improvement of the state's agricultural and tourist resources and the Virginia Planning Board's assistance to the state selective service system in drafting a unified plan for reemployment and rehabilitation of veterans and war workers, while continuing its consulting service to local planning boards, are outstanding.

Municipal planning activity

In the field of municipal planning, it is reported that Cincinnati took the spotlight in 1944, succeeding Louisville, Ky. and Syracuse, N. Y., which provided outstanding planning services in 1943. Cincinnati's program emerged clearly in late summer, when the master planning division of the city plan commission was given authority to make a comprehensive plan for an urban area including all of Hamilton County and two Kentucky counties—Kenton and Campbell. Full participation in development of the plan and support for its execution is insured by a working agreement among ten separate units of government represented on the Cincinnati Metropolitan Planning Commission.

The Louisville Area Development Association, financed by both public and private funds, during 1944 issued reports on flood walls, industrial employment, the central business district of Louisville, traffic, etc. Public participation in the plan-making is a prime factor in the Louisville program, with careful review of all proposals by municipal departments concerned and by the Louisville and Jefferson county planning and zoning commission to insure a coordinated and financially realistic plan.

In Syracuse, N. Y., a postwar planning project, which covered both the city and Onondaga County, was terminating in May. The committees working on the project recommended that a new official organization be created to mold into a master plan for the region the tentative plans of the various citizen committees. These plans—an amazing summary of public opinion and a milestone in public participation—will be published shortly, according to the American Society of Planning Officials.

Cleveland's record in metropolitan planning last year was said to be unique. Work of the Regional Association, whose director serves as chairman of the city planning commission, made possible integration of region-wide plans on an unofficial basis. The association's recent report, "Express Highway Plan for the Cleveland Metropolitan Area," evidences close cooperation among a number of operating agencies.

Nevada and Montana Plan Public Works Improvement

Calling for an expenditure of $62,060,501, the Nevada State Planning Board has completed a six-year construction plan embracing highway, water resources and other state building projects. Meantime, Montana is seeking legislation to finance public works planning.

With work divided into three two-year periods from 1945 to 1951, the Nevada plan is described, as one which may be prosecuted whenever economic conditions warrant. Money would come from six sources, including state bonds, general funds, outside funds, federal highway aid and state highway funds.

The Nevada plan calls for $34,728,000 to be spent on highway construction and $21,996,000 for a state engineer's office for development of water resources, including the Army Engineers' controversial proposal to convert Washoe Lake into a storage reservoir.

Creation of a state postwar planning and construction commission and the appropriation of $4,500,000 to finance a long-range program of public improvements in Montana is proposed in a bill now before that state's house of representatives. Another bill would permit municipalities to levy a five-mill tax to accumulate postwar street construction funds.

Book Notes and Reviews

The month's addition to the engineer's reading and reference list

Airport Design Data

AIRPORT ENGINEERING—By H. Oakley Sharp, G. Reed Shaw and John A. Dunlop. 150 pp. John Wiley & Sons, New York; Chapman & Hall, London.

Scattered information about the design and construction of airports is brought together in convenient form in this book. The authors have drawn largely from publication of the Civil Aeronautics Authority, the Public Roads Administration, Corps of Engineers, Asphalt Institute, Portland Cement Association, Armco Drainage Products Association, Concrete Pipe Association and from this journal. The result is a textbook that should be especially useful in engineering schools. For the practicing engineer, the book would have been improved by a bibliography of the source material.

A Plan for Revamping the Construction Industry

TOMORROW'S BUSINESS—By Beardsley Ruml. 238 pp. Published by Farrar & Rinehart, Inc., New York. Price $2.50.

The place of public works in the national economy and the "costly" and "wasteful" construction industry are critically examined in one chapter of Beardsley Ruml's analysis of *Tomorrow's Business*. Regardless of the interests of this magazine's readers in general business philosophy, they will find plenty to capture attention in the single chapter specifically related to the business of their livelihood. And it is a safe wager that the balance of the book will be read, too, because Mr. Ruml is an enthusiastic and convincing writer.

In examining past experience with public works as a sustainer of business activity during the depression of the 1930's, Mr. Ruml points out that this emergency program was "public work" rather than "public works," and although many of the undertakings could meet the test of necessity and desirability, they broke down on the test of efficiency and reasonable cost. The biggest lesson to be derived from this experience, he says, is that the scale on which public works must be pressed in order to do any good in a period of unemployment is vastly greater than we had been led to believe. It is so vast, in fact, that the use of public works as a stabilizer of the whole economy might well be abandoned.

Mr. Ruml argues that the most we should expect to accomplish with public works programs is to stabilize the construction industry. And it is suggested that a program for this purpose might have as its goal a volume of work based on average rebuilding of our physical plant once a generation (30 years). Such a program would require about eight percent of the annual national product and would keep 6,500,000 men employed on and off-site.

Preparatory work for proper timing and avoidance of waste in executing a program cannot be done, Mr. Ruml states, unless there is a national policy on the purpose, scope and scale of the federal public works program.

For the construction industry—which is involved in public works expenditures regardless of national policy—Mr. Ruml expresses the hope that it will grow out of unregulated anarchy into an orderly pattern of effective competition. Because it is always fighting for survival, subject to the feasts and famines of seasonal and cyclical demand, the industry has been forced to adopt restrictive measures that might be characterized as "notorious". These measures are in many cases ingenious, in some cases illegal, and in all cases for the purpose of price maintenance and control of competition. All these practices, says Mr. Ruml, spring from a common need of the industry to make sure that the scale of prices obtained at times when there is work to do is sufficient to pay for periods of idleness, too.

He calls for a dignified and competent Congressional investigation of the industry with a view toward establishing its status as that of a quasi-public utility supervised by an appropriate regulatory body. Mr. Ruml finds justification for such action because an industry that is looked to for eight percent of the national income is a matter of national concern. Particularly is this true, says he, when the industry cannot stabilize itself without resorting to inefficient restrictive practices which increase costs, postpone innovations and introduce elements of lawlessness into the industry.

Regardless of the views you may hold, Mr. Ruml's book, and Chapter 11 in particular, will give you something about which to think.

Sediment Records

RATES OF SEDIMENT PRODUCTION IN SOUTHWESTERN UNITED STATES—By Carl B. Brown. 40 pp. Published by U. S. Dept. of Agriculture, Soil Conservation Service, Washington, D. C., 1945.

Despite the critical importance of sediment in Western water developments, accurate records of the sediment loads of streams are extremely meager. Such records as exist are widely scattered, often in obscure publications or in private files. Where published, the summary data are often difficult to evaluate from lack of information on the manner of their collection.

In this publication are compiled, evaluated and translated into comparable units all of the known data that might be usable in estimating quantities of sediment carried by streams in the region embracing the Great Basin interior drainage, the Colorado and Gila River watersheds, and the Rio Grande and Pecos River watersheds above the junction of these streams.

Reinforced Concrete

CALCULO DE CONCRETO ARMADO—Volume I—By Telemaco van Langendonck. Published by Associacao Brasileria de Cimento Portland, Sao Paulo, Brazil.

This is a pioneer Brazilian book on reinforced concrete, which, though written in Portugese, can be understood fairly easily by anyone familiar with French and German texts. Loosely bound in paper covers, it should be rebound before using. Being the first of a set, it is not complete and expends a good deal of space on theories of stress distribution and related subjects, leaving only limited room for con-

sideration of concrete members under axial stress. The review of data from the strength of materials and theory of elasticity is much more extended than our own books find necessary. Mathematical approaches to design problems receive much attention.

Following this review, the properties of concrete, steel and reinforced concrete are reported quite completely from tests all over the world, but with emphasis on European researches. About two-thirds of the book is devoted to preliminary subjects.

The final chapter deals with columns both without and with spiral reinforcement, distribution blocks, and ties, discussion of beams, slabs, frames and other members being reserved for a later volume. The column studies emphasize the Euler type of formula and give reduction "form" factors for various cross-sections, including L, C and T shapes, as well as other reduction factors for tapered shafts of quite a few types.

Under the title of bearing blocks, analyses are made of ordinary spread footings by the theory of elasticity applied to tapered cantilevered beams. This study is extended to cover blocks whose thickness is greater than their side width, such as bearing blocks for heavy loads on rock or very hard soil, as might occur with bridge piers or machine foundations. The "pendulum" link to produce statical determinacy receives considerable attention as do hinges of both the Mesnager and the roller-and-socket type, which are described and the stresses analyzed very completely. The chapter closes with a study of tie members such as those across tied arches, or the legs of rigid bents, or hangers from an overhead support, the stress in the tension steel being limited by the elongations which the surrounding concrete can accommodate. Some reference is made to pre-stressing and hoop tension.

The appendix contains very elaborate tables of the properties of many sorts of plane sections, for determination of the kern, for the ellipse of stress, and for computing principal stresses at all angles. Form factors are tabulated for many column sections, including polygonal, round, L, C, and T shapes, and for various types of tapered shafts. Trapezoidal, circular and hollow circular columns are scheduled as well as values for various degrees of end fixity at top and bottom. The very multiplicity of tables makes it difficult to use them rapidly. All values of loads, dimensions and sizes throughout the text are in the metric system except the diameter of reinforcing bars which is expressed in fractions of an inch, requiring some conversion factor in each computation.

The author has assembled a quantity of useful information that would be of considerable benefit to the researcher and might interest those readers who wish to broaden their knowledge and familiarize themselves with the practices in a country where reinforced concrete design is proceeding at a rapid pace. When the companion volume dealing with flexure and continuity appears this reviewer hopes to obtain a copy and widen his knowledge of Brazilian methods. —*Reviewed by* RAYMOND C. REESE, *Consulting Engineer, Toledo, Ohio.*

Technical Translator

ENGLISH-SPANISH COMPREHENSIVE TECHNICAL DICTIONARY—Compiled by Lewis L. Sell, 1,478 pp. Published by McGraw-Hill Book Co., New York and London, 1944. $30.

Designed to eliminate misconceptions and circumlocutions on the part of all who must translate technical English into correct technical Spanish, Mr. Sell's new comprehensive technical dictionary stresses accuracy of expression in more than 150 commercial and industrial fields. While this book is not designed as a vocabulary aid for students who seek the meaning of specific Spanish words, it should prove a valuable tool for those who must write correct and intelligible Spanish to industrial contacts in Spanish-speaking countries.

Five special features have been incorporated in this lexicon: (1) All existing synonyms are fully listed under the leading term; (2) all synonyms are cross-referenced, with the additional advantage of numerous references to related expressions; (3) thorough investigation of all related and individual fields has led to inclusion of all expressions in literature relating to a given term; (4) terms relating to operation of cars and engines, repair operations, city and highway signaling systems, etc., never before treated, are listed; and (5) differentiation is made between British and American linguistic usage.

Other assets to the technical writer are the listing of important antonyms and the numerical keying of terms to their specific technical fields.

Mr. Sell, known widely for his English-French dictionary, has included more than 525,000 technical terms in his latest compilation.

New Engineering Books

ENGINEERING CONTRACTS AND SPECIFICATION—By Robert W. Abbett, 188 pp. John Wiley & Sons, Inc., New York; Chapman & Hall, London. $2.25.

THE MODERN GAS TURBINE—By R. Tom Sawyer. 216 pp. Prentice-Hall, Inc., New York. $4.

THE MAGIC POWDER—History of the Universal Atlas Cement Co. and the Cement Industry.—By Earl J. Hadley. 382 pp. G. P. Putnam's Sons, New York, $3.50.

ECONOMIC PROBLEMS OF LATIN AMERICA—By Seymour E. Harris. 465 pp. McGraw-Hill Book Co., Inc., New York and London. $4.

THE THEORY AND PRACTICE OF REINFORCED CONCRETE, Second Edition—By Clarence W. Dunham. 558 pp. McGraw-Hill Book Co. Inc., New York and London. $4.50.

WOOD TECHNOLOGY—Second Edition—By Harry Donald Tiemann. 328 pp. Pitman Publishing Corp., New York. $4.

DATA SHEETS—By Don Graf. 795 pp. Reinhold Publishing Corp., New York. $5.

PROVIDING FOR UNEMPLOYED WORKS IN THE TRANSITION—By Richard A. Lester. 152 pp. McGraw-Hill Book Co., Inc., New York and London. $1.50.

SOLDIER TO CIVILIAN—By George K. Pratt. 233 pp. McGraw-Hill Book Co., Inc., New York and London. $2.50.

METEOROLOGY—By George J. Brands. 235 pp. McGraw-Hill Book Co., New York and London. $2.50.

ARC WELDING ENGINEERING AND PRODUCTION CONTROL—By Walter J. Brooking. 347 pp. McGraw-Hill Book Co., Inc., New York and London. $4.

PRACTICAL DESIGN FOR ARC WELDING, Volume II—By Robert E. Kinkead. The Hobart Brothers Co., Troy, Ohio. $3.50.

A.S.T.M. STANDARDS, 1944, Part II, Non-Metallic Materials—Constructional—1649 pp. American Society for Testing Materials, Philadelphia.

(*Continued on page* 150)

AMERICA WANTS COMPETITION

Only American Initiative Can Preserve It in World Trade

ERICANS generally agree upon what constitutes a desirable pattern of international economic relationships. We want an expanding world trade, with mum recourse to government-imposed trade barriers discriminatory trading arrangements, and offering scope for competitive private enterprise. Because are necessary to such trade, we want also stability change rates, and national currencies that are mutuconvertible at least for the settlement of current nts. We want, too, arrangements to facilitate long-capital loans with security to the lender and advanto the borrower.

w other nations subscribe to these aims with enastic conviction. Some reject them flatly as impracunder the conditions likely to prevail during the ar period, or achievable only at prohibitive cost to domestic economies.

less, therefore, we can formulate a practical and rehensive program to carry out our aims, and con- other nations that we will take a sustained and resible part in making it effective, the international of the world surely will be conducted under a sysof exchange controls, bilateral agreements, cartel ains, import quotas, and direct government purchasrrangements that are the very antithesis of the comive system that we favor.

agree upon a concrete American **program,** and to nince other nations that it is to their advantage as as ours to accept it, is a major task of economic smanship. It entails reversing a trend which has isted since World War I, and which has been intensiduring the depression years of the nineteen-thirties by the exigencies of World War II.

learly, that is not a task to be assumed lightly. We can to be successful only if (1) we have a deep convicthat what we seek is fundamentally important to the erican interest, and (2) if we will take pains to underd why other nations fear that such a program may ardize their interests, and then make whatever acmodations may be necessary to resolve their doubts.

n expansive foreign trade policy has been advocated vigorously and repeatedly in America recently that Economist (of London) comments wryly upon what erms the ironic circumstance that "the acceptance of principles of free trade by the more literate (Ameri-) public should come at a time when the doctrines in ir simplest nineteenth-century form have been pretty erally emasculated in fact and repudiated in principle the rest of the world".

☆ ☆ ☆

Why are we opposed to managed world trade, and for mpetitive world trade?

First, we are against rigged and managed internaal markets because we know that successful participation necessitates a comparable degree of control over the domestic economy as well. There is little debate of this fact, and those nations which accept a managed external trade as a necessary protective measure are generally willing to pay the price in internal regimentation. We are not. For us to do that would be as alien to our genius as it is repugnant to our conviction.

Second, we believe that the United States will be able to compete successfully in world markets, even though we have, and intend to maintain, wage scales far higher than those of the nations whose competition we must meet.

There is impressive evidence to substantiate the soundness of this conviction:

1. Wage scales, of themselves, do not determine the competitive position. They are meaningful only when translated into labor costs, by dividing wage rates by units produced. **A recent War Production Board study shows that in manufacturing industries generally, during the period immediately before the present war, production per man hour in the United States exceeded that in the United Kingdom, Germany and Soviet Russia by a ratio of more than 2½ to 1, and that of Japan by more than 4 to 1.** When comparison is made with available wage data, it appears that our labor costs are generally on a competitive plane.

2. Perhaps the best evidence of our ability to compete in export markets is the record of our demonstrated capacity to do so in the past. **During the entire period between World Wars I and II, the United States consistently commanded a greater share of the world's export trade than any other nation,** although the United Kingdom took a larger percentage of world imports.

3. We have been particularly successful in world trade competition in the export of machinery, vehicles, a variety of manufactured specialties, and certain agricultural products. Except in the last-named field, there is every evidence that we enjoy genuine competitive advantage over other nations, and this advantage will have been increased rather than diminished by developments during the Second World War. It is noteworthy that the goods in which we have been able to compete most successfully have generally been the products of our high wage industries rather than those in which low wages have prevailed.

☆ ☆ ☆

It is clear that, on a price basis, we shall be able to compete successfully in postwar markets in numerous lines. It is equally clear that such an opportunity is by no means of negligible importance to our own economy as a whole. During the years in which the censuses were taken between 1909 and 1939, our exports amounted

to from 7 to 16 per cent of our entire production of movable goods. In the year 1938 our exports in each of the following lines accounted for more than 10 per cent of total domestic production of the particular product.

(The figures in parenthesis are the percentages of total production exported.)

CRUDE MATERIALS: Phosphate rock (51.5), cotton (30.5), tobacco (29.4).

FOODSTUFFS AND BEVERAGES: Linseed (49.4), dried fruits (36.2), canned sardines (29.4), rice (21.0), fresh pears (15.9), canned salmon (13.8), canned asparagus (13.2), canned fruits (13.0), wheat (12.2), lard (11.7).

SEMI-MANUFACTURES AND FINISHED MANUFACTURES: Refined copper (53.1), paraffin wax (46.3), gum turpentine (42.6), carbon black (40.8), gum rosin (38.0), borax (35.9), crude sulphur (35.6), aircraft and parts (26.8), office appliances (22.3), carbons and electrodes (21.8), printing and bookbinding machinery (18.2), agricultural implements and machinery (17.0), biologic pharmaceuticals (15.3), industrial machinery (14.4), dental instruments and supplies (14.3), automobiles (14.1), benzol (13.3), goat and kid upper leather (12.8), refined lead (12.0), radio apparatus (11.8), caustic soda (11.4), refined mineral oils (10.6).

It is of major concern to all engaged in these lines of activity and in many others that foreign markets be not closed to us. It is particularly to our interest to have export outlets for our war-expanded capital goods and equipment industries. Since we undertook an important percentage of such expansion in order to furnish munitions to our Allies, it is reasonable to ask their cooperation in cushioning what inevitably must be a drastic readjustment here. The case is strengthened by the fact that the postwar world will desperately need the equipment items that we, alone, can supply.

But our demonstrated ability to compete on a price basis will not, of itself, assure us of foreign market outlets. Transportation costs, quality of product, marketing skill, technical and repair service—all are basically important. Still more important are non-discriminatory open markets and the command of dollar exchange by prospective purchasers. Our export potentials will surely be cramped in a world organized on the basis of bilateral deals and exchange controls. The availability of dollar exchange must depend upon the level of American imports and the volume of American capital loans.

☆ ☆ ☆

How are we to explain the skepticism of other nations toward an order which to us seems so clearly to represent not only our interest but the long-range interest of the world as well?

Soviet Russia, of course, is committed to conducting its external trade through its central government. But what of the United Kingdom? Why are there so many British voices that counsel the abandonment of what has been Britain's traditional position for more than a century? If we can understand that, we shall understand the dissent from our position of most nations whose economic positions have weakened and whose fiscal problems have multiplied during the two World Wars and the ill-starred period between them.

Essentially, their case is this:

Partly, they were forced into managed external
policies by the Axis self-sufficiency programs, ad
in preparation for aggressive war. That can be corr
only by crushing the Axis, and by establishing a
security system that will make self-sufficiency a
compelling need.

But primarily, the reluctance of peaceably inc
nations to forego restrictive controls over postwar fo
trade stems from a deep-seated fear that is even
difficult to resolve. They fear, on the basis of past
perience, that their efforts to meet payment bal
arising from normal foreign trade would force a def
of their internal economies, affecting prices, credit, w
and finally employment. Faced with the choice, as
see it, between making adjustments in foreign tra
in their domestic economies, they lean toward the fo
as, at worst, the lesser of two evils.

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Since the kind of world trade system we seek is
pendent upon international arrangements to assure
sonable stability of exchange rates between nati
currencies, we are challenged to find a formula that
will provide this and at the same time allay what o
nations believe are legitimate fears with respect to t
domestic economies.

But at least two major steps toward resolving
doubts can be taken upon our own initiative wit
recourse to the intricate process of international ne
tiation.

One is the rational overhauling of our tariff syst
to provide other nations with increased opportunit
export to us. We can, and should, do this in a way
avoids undue cost to any segment of our economy.

The other, and probably the greatest contribution
can make toward winning a reluctant world to our p
of view, will be to offer ample and convincing evide
that we are ready and able to provide a high level
employment in the United States. If we can do that,
rest of the world will wish to expose itself to our
fluence rather than to insulate against it, since prosper
here is the greatest single contributing factor to wo
wide prosperity.

Balance of payment problems are minimized i
world of thriving trade. Britain would have little rea
to resort to exchange controls if the total of post
world imports and exports reaches an 80 billion do
level. She may well be in a desperate plight if it sho
revert to the 1935 level of 40 billions.

☆ ☆ ☆

The United States wants a world in which priv
enterprise and competition play a major role. To obt
such a world will require a wiser, more understandi
and firmer world leadership than this nation, or perha
any nation, ever has exerted heretofore.

James H. McGraw, Jr.

President, McGraw-Hill Publishing Co., I

Stop that thieving demon *RUST* with new

SHELL RUST-PREVENTIVES

WHAT IS RUST'S annual "cut" in your business? How much should you charge off to this thievery? Probably much more than you think!

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That is no new story. *The news is that Shell has perfected and now presents a complete line of Rust Preventives* . . . the new Shell Ensis Rust Preventives for coating metals . . . the new Shell Tellus Oils for lubrication.

Shell Ensis Rust Preventives embody a complete line of oils, fluids and compounds. They are available in various grades and provide protection against the dangers of exposure. Their protective coatings range from thin, transparent films for indoor use to heavy, abrasion- and weather-resistant coatings for outdoors.

Shell Tellus Oils do not *remove* rust . . . However, where moisture is a factor, special rust-inhibiting qualities built into them afford protection against the formation of rust, without sacrifice of other valuable characteristics.

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SHELL

SHELL ENSIS Rust Preventive Coatings

SHELL TELLUS Rust Preventive Lubricating Oils

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

TUNNEL AND CHANNEL IMPROVEMENTS BOULDER DAM

OWNER: Bureau of Reclamation, Boulder City, Nev.; Boulder Canyon Project, Arizona-California-Nevada.

PROJECT: Tunnel and river channel improvements at Boulder Dam, Boulder Canyon Project, Arizona-California-Nevada. Work is on Colorado River about six miles northeast of Boulder City, and is for purpose of recovering about four feet of operating head for Boulder Power Plant that was lost because of increased tail-water elevation resulting from bars and accumulations of broken rock and other material in channel downstream from portals of the two spillway tunnels and the two outlet tunnels. Condition to be corrected by dredging river channel from tunnel portals to river-gaging station (3,000 ft). Prevention of recurrence of condition entails removal from canyon walls or river banks all material which may be dislodged and come to rest in river channel. Tunnels to be modified to eliminate discharge characteristics which contribute to formation of undesirable bars in channel. This will simplify unwatering of tunnels for repair and inspection, and also improve hydraulic performance. Portion of road leading to powerhouse to be relocated.

CONDITIONS: Government will furnish cement, admixtures, sand (except for sandblasting), coarse aggregate, reinforcement bars, metal pipe and fittings, metal water stops, elastic filler material, and all other materials that will become part of completed construction work. Sand and certain coarse aggregate will be furnished in stock piles in Las Vegas Wash, other coarse aggregate in Hemenway Wash. Completion time 750 calendar days. Rail and highway transportation facilities available. Wage rates are: skilled labor, $1.25 to $1.75 per hour; semi-skilled 90c. to $1.25; and common labor, 90c.

LIST OF BIDDERS: (Bids opened January 30, 1945)

1. Guy F. Atkinson Co., San Francisco, Calif. (low bidder) $2,586,450
2. Morrison-Knudsen Co., Inc., Los Angeles, Calif. 2,642,965
3. Utah Construction Co., San Francisco, Calif. 2,762,620
4. Hunkin-Conkey Constr. Co.; Hinman Bros. Co.; Shofner, Gordon & Hinman; Rhoades Bros. & Shofner, Los Angeles, Calif. 2,769,335
5. Al Johnson Constr. Co.; Peter Kiewit Sons; Western Contracting Corp., Minneapolis, Minn. 3,105,262
6. Arundel Corp.; L. E. Dixon Co., Los Angeles, Calif. 3,398,523
7. United Concrete Pipe Corp.; Ralph A. Bell; Baruch Corp., Los Angeles, Calif. 3,596,626
8. S. A. Healy Co., Chicago, Ill. 3,617,500
9. Macco Constr. Co.; Bressi & Bevanda Constructors, Clearwater, Calif. 3,697,275
10. Spencer White & Prentis, Inc.; Gunther & Shirley Co.; W. E. Callahan, Los Angeles, Calif. 4,757,475

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Diversion and care of river during constr. and unwatering foundn. for addition to Tunnel No. 1	Lump Sum	$200,000.00	$70,000.00	$200,000.00
2. Excavation, all classes, stripping Nevada canyon wall of loose rock	1,000 c. y.	5.00	8.00	8.00
3. Excav., all classes, above El 647 on Arizona River bank	200,000 c. y.	1.20	1.75	1.00
4. Excav., all classes, above El. 647 on Nevada River bank	350,000 c. y.	1.10	1.75	1.00
5. Excav., all classes, below El. 647 in river channel	275,000 c. y.	1.48	1.75	2.10
6. Excavation, rock, for road	15,000 c. y.	1.60	3.00	1.50
7. Excavation, rock, for struct.	12,000 c. y.	4.00	4.50	5.00
8. Excavation of concrete	2,600 c. y.	25.00	22.00	75.00
9. Backfill	25,000 c. y.	.80	1.00	1.00
10. Compacting backfill	1,000 c. y.	2.50	1.70	1.50
11. Drilling grout holes	1,200 l. f.	2.50	2.30	4.75
12. Install grout pipe and fittings	1,500 lb.	.50	.40	.60
13. Pressure grouting	5,000 c. f.	1.50		2.20
14. Install 4-in. cast iron pipe drains	3,500 lb.	.20		.20
15. Install 12-in. c. i. pipe drains	55,000 lb.	.05		.10
16. Conc. in foundation for addition to Tunnel No. 1	1,500 c. y.	11.00		13.00
17. Concrete in addition to Tunnel No. 1	22,000 c. y.	24.00		16.50
18. Concrete in existing tunnels	12,500 c. y.	24.40		16.50
19. Concrete in tunnel portal aprons	2,400 c. y.	12.50		18.00
20. Conc. in gravity walls	3,500 c. y.	20.00		22.00
21. Conc. in road surfacing	800 c. y.	17.00		21.00
22. Concrete in cavern	500 c. y	12.00		16.00
23. Placing reinforcement bars	5,500,000 lb.	.028		.02
24. Special finishing of conc. surfaces	3,200 s. y.	3.00		4.40
25. Install elastic joint-filler mat'l	1,000 s. f.	.40		.33
26. Place metal water stops	8,000 lb.	.40		.40
27. Welding 1¼-in. square reinforcing bars	20,500 welds	1.90		2.75

EARTHWORK AND STRUCTURES ALTUS PROJECT, OKLA.

OWNER: Bureau of Reclamation, Altus, Oklahoma.

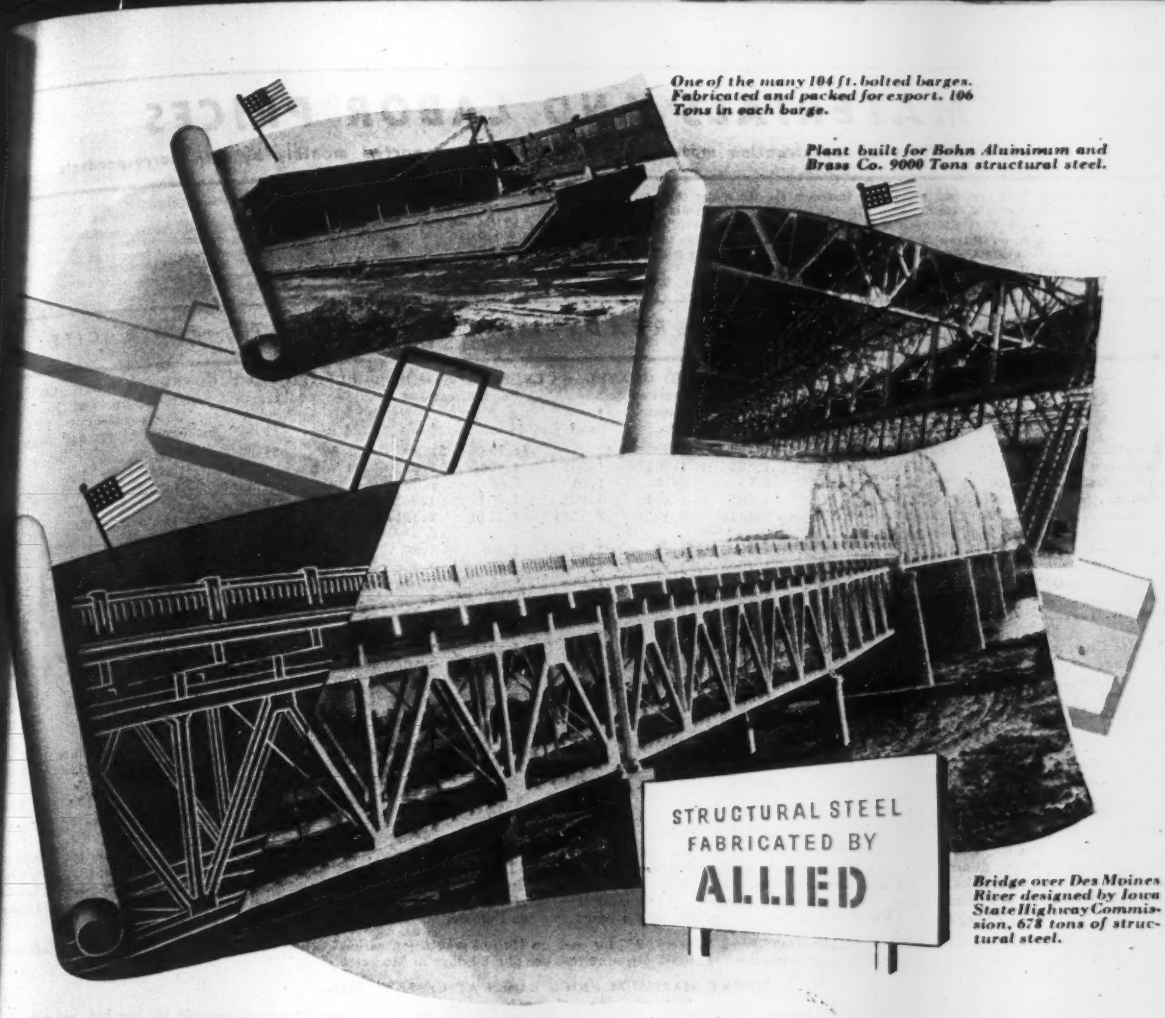
PROJECT: Construction of the West Canal turnout at Station 224+25.3, Altus Main canal; the check at Station 244+48.95, Altus Main canal; and earthwork and structures between Station 0+75.5 and Station 589+25, West canal, Altus Project, Oklahoma. Work is located north and west of Blair, Okla.

CONDITIONS: Contractor to furnish all coarse aggregate for concrete; all form materials; all wire, wire ties; metal or other temporary supports; all water used for mixing, cleaning and curing concrete, mortar and grout, for compacting backfill, and for moistening embankment materials to be compacted; sealing compound; all backfill materials; all rock and rock spalls; spikes or nails less than twenty-penny in size; and all other materials not part of completed construction work required for completion of the contract. Government to furnish all other materials. Time for completion is 160 calendar days. Rail and highway transportation facilities available. Wage rates are: skilled labor, $1.125 to $1.50; semi-skilled, 62½c. to $1.125; and common 57½c.

LIST OF BIDDERS: (Bids opened November 20, 1944)

1. H. M. Thompson & Co., Ellinwood, Kan. (low bidder) $153,107
2. Spencer Constr. Co., Carrollton, Tex 170,830
3. Morrison-Knudsen Co., Inc., Boise, Idaho 173,967
4. Austin Bridge Co., Dallas, Tex 215,280
5. Morse Bros. & Assoc., Inc., Shreveport, La 216,953
6. E. O. Korsmo Constr. Co., Memphis, Tenn 229,760
7. J. A. Terteling & Sons, Inc., Boise, Idaho 231,876
8. Leo Sanders, Oklahoma City, Okla 259,672
9. A. G. Sherwood Constr. Co., Independence, Kan 278,460
10. Bozeman & Gray, Morgan City, La 286,202
11. Green & Groesbeck, Des Moines, Iowa 350,253

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excavation for canal	193,000 c. y.	$0.20	$0.24	$0.15
2. Overhaul	99,000 sta. c. y.	.025	.015	.02
3. Compacting embankments	72,000 c. y.	.06	.12	.20
4. Excavation for drainage channels and dikes	46,000 c. y.	.30	.30	.20
5. Excavation for structures	20,100 c. y.	.80	.70	1.00
6. Backfill	14,000 c. y.	.35	.26	.25
7. Compacting backfill	7,300 c. y.	.80	.60	1.00
8. Concrete in structures	1,780 c. y.	25.00	28.00	35.00
9. Placing reinforcing bars	183,000 lb.	.045	.035	.05
10. Dry-rock paving	1,460 s. y.	2.50	7.00	3.00
11. Erecting timber in structures	77 M bm.	75.00	100.00	50.00
12. Lay 18-in. concrete pipe	180 l. f.	1.80	1.50	4.00
13. Lay 24-in. concrete pipe	20 l. f.	2.50	2.00	6.00
14. Lay 30-in. concrete pipe	64 l. f.	3.00	2.50	7.00
15. Lay 48-in. concrete pipe	148 l. f.	4.50	3.00	8.00
16. Place metal water stops in joints	1,100 lb.	.50	.40	.30
17. Installing gates	15,500 lb.	.10	.05	.20
18. Install miscellaneous metal work	8,000 lb.	.20	.05	.20



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MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents

PORTLAND CEMENT and cast iron pipe price increases are the major changes reported to *ENR* for March. Portland cement is up 17c. per barrel in Minneapolis, and up 28c. per barrel in St. Louis. This rise boosted ready-mixed concrete prices in both of these cities, and in addition, an increase has been reported in Dallas. Cast iron pipe prices increased $1.00 in all twenty United States cities reporting, and climbed from $49 to $50 per net ton at the mill.

Vitrified sewer pipe is lower on the 8- and 12-in. sizes in Cleveland. Wrought steel pipe discounts have been reduced in Kansas City. Structural clay tile prices are up in Cleveland and Dallas.

Prices on aggregate, paving asphalt, structural shapes, reinforcing bars, ready-mixed paint, roofing materials, and brick are unchanged from the preceding month.

The bricklayers' rate in Kansas City has been raised from $1.65 per hour to $1.75. Common labor on building construction in Detroit which formerly ranged from $0.90 to $1.00, is now $1.00 per hour; and common labor on heavy construction in the city is now $1.00 per hour, up 10c. from last month.

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F.O.B. CITY

	PORTLAND CEMENT—Per bbl., C/L lots, incl. 40c. per bbl. for bags, cash dis. not deducted			SAND AND GRAVEL—Per ton, carload lots			CRUSHED STONE—Per ton, carload lots		CRUSHED SLAG—Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.; truckload del.; per block		CONCRETE Ready Mixed 1:2:4, 6 sack, 50 c.y., del.
	Cloth *a*	Paper	Bulk	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand-grav.	Lt.wgt. Agg.	
Atlanta	$2.77	$2.52	$2.47	$1.79	$1.89	$1.99	$1.79	$1.89	$1.59	$1.69	$0.17	....	$8.00
Baltimore	2.62	2.37	2.12	1.80‡	1.80‡	1.30‡	1.80‡	1.80‡	1.75‡	1.75‡	.125	$0.125*w*	7.45
Birmingham	2.50	2.25	2.10	1.75	1.75	1.50	.85	1.00	.90	1.15	.1425	....	5.80
Boston	2.97*b*	2.72*b*	2.52	1.50‡	1.50‡	1.05‡	1.25‡	1.35‡	....	....	.13	.155*w*	7.55
Chicago	2.90	2.65	2.50	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	1.75‡	1.75‡	.16	.16*x*	....
Cincinnati	2.41	2.16	1.96	1.20	1.20	1.10	1.80	1.80	....	....	.12	.15*w*	6.70
Cleveland	2.49	2.24	....	1.75*i*	1.75*i*	1.55*i*	1.80*i*	1.80*i*	1.73‡*i*	1.73‡*i*	.14	.14	7.45
Dallas	2.51	2.26	2.06	1.50*p*	1.70*p*	1.10*p*	1.69*p*	1.79*p*	....	....	.15	....	7.15
Denver	3.08	2.88	2.32	1.20	1.30	1.25	1.65	1.75	1.00	1.00	.15	....	7.25
Detroit	2.49	2.24	2.09	1.50	1.50	1.50	2.25	2.25	2.00‡	2.00‡	.13	.14*w*	7.15
Kansas City	2.58	2.33	2.18	1.85	2.30	1.00	1.91	1.91	....	....	.125	.125*wy*	7.80
Los Angeles	3.20	2.60*v*	....	1.30	1.30	1.15	1.30*f*	1.30*f*	....	....	.04*bb*	.10*aa*	7.30
Minneapolis	3.07	2.82	....	1.00*h*	1.00*h*	.25*h*	1.00*h*	1.00*h*	....	....	.12	.16	7.55‡
Montreal	....	1.95*rs*	1.79*rs*	1.65‡*s*	1.65‡*s*	1.50*t*	.80*ct*	.90*ct*	....	....	.14*t*	.14*wt*	7.85*s*
New Orleans	2.42	2.16	1.96	1.67	1.65	1.22	....	....	.90	1.15	.19	....	9.25
New York	2.85‡	2.60‡	....	1.60*de*	1.60*de*	.90*de*	1.70*de*	1.80*de*	....	....	.16	.14*wcc*	7.50*k*
Philadelphia	2.73	2.48	2.28	1.55‡	1.65‡	1.20‡	1.90	1.95	1.10	1.10	.155	.155*w*	8.45
Pittsburgh	2.65	2.40	2.20	1.65‡	1.65‡	1.85‡	2.25‡	2.25‡	1.50	1.50	.17	.17*x*	8.40
St. Louis	3.08	2.80	....	1.75‡	1.75‡	1.25/1.50‡	1.10*h*	1.10*h*	.90*g*	1.15*g*	.145	.13*w*	8.25
San Francisco	2.21	2.01	1.71	1.36	1.36	1.36	1.46	1.46	....	....	....	.21*y*	7.55
Seattle	....*u*	3.00*e*	....	1.00*e*	1.00*e*	1.00*e*	2.00*e*	2.00*e*	....	....	.16	.16*y*	7.25

‡ Delivered. *a* 10c. allowed for each returnable bag *b* 10c. per bbl. off for cash. *c* F.o.b. quarry. *d* Per cu. yd. *e* Barge lots alongside docks. *f* Crushed granite. *g* F.o.b. Granite City, Ill. *h* F.o.b. plant. *i* Within three miles of Public Square. *j* 5% discount for cash. *k* Discount of 2 percent for cash in 10 days. *l* Up to 200 cu. yd. *m* 50c. off for cash. *n* 25 c.y. or more. *o* 2% off for cash. *p* 10c. per ton off, cash 15 days. *r* 10c. per bbl. off, cash 20 days. *s* 8% sales tax included. *t* 8% sales tax not included. *u* Withdrawn *v* 20c. per bbl. discount; 20c. allowed for returnable cloth bag. *w* Cinder. *x* Waylite. *y* Haydite. *z* Celocrete. *aa* Pumice. *bb* 4 x 8 x 12 in. *cc* Also 8 x 18 x 18 in.

CASH DISCOUNTS CEMENT to Contractors: truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount, 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICE BASES AT CEMENT MILL

Charge for bags not included. For cloth bags, add 40c. per bbl.; 10c. refund allowed for each returnable bag; for paper bags add 15c. per bbl., not refundable.

	Bagged	Bulk		Bagged	Bulk		Bagged	Bulk
Buffington, Ind.	$1.70	$1.65	Ironton, Ohio	$1.70	$1.65	Richard City, Tenn.	$1.80	$1.75
Dallas, Tex.	....	....	Limedale, Ind.	....	....	Steelton, Minn.	1.80	1.75
Hannibal, Mo.	1.70	1.65	Norfolk, Va.	....	....	Universal, Pa.	1.75	1.70
Hudson, N. Y.	....	....	Northampton, Pa.	1.75	1.70	Waco, Tex. (Plus 9c. tax in Tex.)	1.75	1.70
Independence, Kans.	1.70	1.65	North Birmingham, Ala.	....	....	Montreal (8% sales tax incl.) Discount 10c. per bbl. 20 days	1.68	1.67

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F.O.B. CITY

	PAVING BRICK AND BLOCK: Granite per M. lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	PAVING ASPHALT: Per ton, less than 80 penetration Tank car	Drums	ASPHALT BINDERS—FLUXES: Per gal., 80–300 penetration Tank car	Drums	CUTBACK ASPHALT: Per ton Tank car	Drums	ROAD OIL: Per gal. Tank car	Drums	ASPHALT EMULSION (Quick-breaking) Per gal. Tank car	Drums
Atlanta	$73.00	$39.35	$2.25	$18.53*e*	.....†	$0.0740*e*	.....†	$0.0806*he*	.....†	$0.0781*e*	$0.0806	.....†
Baltimore	150.00‡	49.00	85.00*m*	15.00*r*	21.00*r*	.06*r*	.09*r*	13.00*r*	23.00*r*	.065*r*	.07*r*	.14*r*
Birmingham	150.00	48.00	.....	17.95	.....†	.0747	.....†	.0834*h*	.....†	.065	.095	.....†
Boston	85.00	59.00	3.75	15.00	24.00	.0625	.115	17.00	30.00	.0625	.0825	.145
Chicago	150.00	55.00	2.50/2.80*d*	14.00	22.50	13.00*g*	21.50*g*	.0575*h*	.15*h*	.05*n*	.09/10*n*	.13/.15*n*
Cincinnati	120.00	53.75	.....	17.00	.....	.085	.....	12.25	.....	.07	.085	.....
Cleveland	120.00	37.25	3.37‡	17.00	19.00	.085	.095	.10*h*	.11	.10	.10	.....
Dallas	.....	36.00	.....	13.65	20.30	.06	.11	16.00	24.80	.06	.05/.07	.07/.09
Denver	.....	16.11	.....	11.00	.....	10.00	.....	.045*h*	.....	.....	.....	.....
Detroit	.....	37.00	.....	18.06*f*	25.60*f*	.0743	.128	.0718*h*	.119*h*	.067	.0775	.1149
Kansas City	.....	44.00	.....	18.50	23.50	.077	.1075	.077*h*	.107*h*	.057	.11	.15
Los Angeles	.....	50.00	.....	9.00*b*	23.00	9.50*bg*	24.00*bg*	9.50*b*	.....	.025	.072	.15
Minneapolis	.....	.....	2.30*d*	.....	27.70	.....	.126	.....	32.64	.....	.....	.....
Montreal	92.40	.....	.....	16.60*k*	24.25*k*	.116*k*	.1485*k*	.115*hk*	.135*hk*	.08*k*	.135*k*	.188*k*
New Orleans	.....	.....	.....	13.50*a*	20.00*a*	.057	.088	.06*h*	.095*h*	.....	.080	.....
New York	.....	65.00	.....	17.40	24.20*p*	14.00	.....	.0725*h*	.1325*hp*	.....	.0725*p*	.119*p*
Philadelphia	140.00	58.00	4.06	15.00*r*	.....	14.00*r*	.....	.0625*h*	.....	.....	14.00*gr*	.....
Pittsburgh	135.00	38.75	.....	18.00	23.00	.09	.16	20.00	36.00	.07	.06	.11
St. Louis	.....	39.00	.....	16.00	22.00	15.00*g*	21.00*g*	.0575*h*	.1212*h*	.048	.06	.11
San Francisco	.....	45.00	.....	10.90	21.15	10.90*g*	18.00*gr*	12.90	17.50*r*	9.50*gr*	.0525	.1125
Seattle	.....	.....	.....	10.90*i*	23.40*i*	.....	20.40*gi*	11.40*i*	.....	.....	.0525*a*	.0625

‡ Delivered. *a* F.o.b. Baton Rouge. *b* Delivered to purchaser's warehouse. *c* 3½x4x8½ in. *d* 2½ in. 12-lb. treatment. *e* Local reduction due to 20% reduction intra-state class freight rates, only Georgia affected. *f* Mexican, *g* Per ton, *h* Per gallon. *i* F.o.b. Martinez. *j* 3x3½x8½ in. *k* Tax included. *l* F.o.b. Toledo. *m* Per thousand. † Available on priority only and quoted specially. *p* No steel drum shipments except to armed forces. *r* February 1943 prices, none later available.

5169½ hours

THIS tire, an 18.00-24 20-ply, was removed from service in a strip mine after 5169½ hours of service. Throughout its life this tire was used on a power wheel of a bottom dump truck. It was never off the wheel during three years of use. Average service of B. F. Goodrich Universal tires on this same operation has been over 4000 hours. Other tires tried out averaged less than half that service.

This tire is built on a new principle of tire construction, with a *shock shield* under the tread to provide greater protection against separation, bruising, and blowouts. The *shock shield* is a set of four breakers, layers of rubber-coated nylon cord fabric, insulated with cushions of special shock-resisting rubber. Under impact the cords in these breakers stretch together—not across each other—and return to their original position, distributing the force of the blow and allowing it to be absorbed by the rubber between them. Thus the shock passed on to the cord body of the tire is greatly reduced.

With greater resistance to bruising and to ply separation, you get longer tire life on the hardest jobs.

All B. F. Goodrich off-the-road tires are made with special compounds which resist cutting. And they are available in five different tread designs, each built for maximum service on a particular type of operation.

Users say their records show B. F. Goodrich tires often last twice as long—and with fewer delays and smaller repair bills.

We urge every user of off-the-road equipment to try B. F. Goodrich tires alongside of other makes. Keep accurate service records. Compare natural rubber tires with natural rubber, synthetic with synthetic, and prove to yourself that you can save money with B. F. Goodrich tires.

Supplies of most sizes of off-the-road tires are strictly limited. It is well to place tentative orders early. See the local B. F. Goodrich dealer for information, or write us direct. *The B. F. Goodrich Co., Akron, Ohio.*

B.F. Goodrich
Truck & Bus Tires

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¼-in. billet *b*	RIVETS ½-in. structural	WIRE NAILS Base *d*	SHEET PILING Base	STEEL RAILS Per Gross Ton: Standard	Light	Re-rolled	Angle Bars	TRACK SUPPLIES: Std. Spikes *c*	Tie Plates *c*	Track Bolts
Birmingham	$2.10	$2.15	$3.75	$2.80	.....	$43.00	$43.00	$43.00*	$2.70	$3.00	$2.15	$4.75
Chicago	2.10	2.15	3.75	2.80	$2.40	43.00	43.00	43.00*	2.70	3.00	2.15	4.75
Pittsburgh	2.10	2.15	3.75	2.80	2.40	43.00	43.00	43.00*	2.70	3.00	2.15	4.75
Buffalo	2.10	2.15	.....	.....	2.40	.....	.....	.....	.....	.....	2.15	.....
Cleveland	2.10	2.15	3.75	2.80	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	.....	2.15	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....
Detroit	.....	2.27‡	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf ports	2.47*a*	2.52*a*	.....	.....	2.85*a*	.....	.....	.....	.....	.....	.....	.....
Pacific ports	2.75*a*	2.80*a*	.....	3.30	2.95*a*	.....	.....	.....	.....	.....	2.30	.....

‡ Delivered. *a* F.o.b. cars dock. *b* Rail steel same as billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per ... * Per net ton

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS* Per 100 lb., ¾ in., base price: 15 tons or over *b* New billet	Rail steel	Add Switch	$/cwt. for Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots: Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING— Per 100 sq. ft., carload lots: 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires *k* Per 100 s. f.	SHEET PILING Per 100 lb. base price
Atlanta	$2.34	$2.40	$2.40	$.02½	$.10	$21.06	$23.00	$1.82	$1.35	$1.91	$3.04
Baltimore	3.70	2.90	2.75	.....	.10	22.50	24.50	1 70	1.27	1.79	3.00
Birmingham	2.10*a*	2.15	2.15	.02½	.10	19.00	21.00	1.80	1.34	1.89	.....
Boston	3.912	3.994	....	$20 C.L.	.10	18.50	29.50	1.76	1.31	1.84	2.77
Chicago	2.10*a*	2.15*a*	2.15*a*	.03	.05	21.50	23.50	1.67	1.25	1.75	2.40
Cincinnati	3.68	2.53*ed*	2.53*ed*	.....	.05	19.50	21.50	1.66	1.25	1.74	.....
Cleveland	2.10*a*	2.15*a*	2.15*a*	.02½	.10	19.50	21.50	1.66	1.25	1.74	.....
Dallas	4.25	3.17	3.17	.....	....	25.50	27.50	1.93	1.42	2.03	.....
Denver	4.57	3.33*k*	....	.....	....	26.50	26.50	1.97	1.45	2.07	.....
Detroit	3.661‡	2.50‡	2.50‡	.....	.10	30.00	30.00	1.68	1.26	1.76	2.66
Kansas City	4.19	2.61*ed*	2.61*ed*	.0	.05	24.50	26.50	1.78	1.33	1.87	2.874
Los Angeles	3.65*f*	2.575	2.425	.02½	.05	23.00	27.50	1.93	1.42	2.03	3.65
Minneapolis	3.81‡	2.73	2.73	.0	.10	25.00	27.00	1.80	1.34	1.89	2.73*d*
Montreal	3.95*i*	2.90*i*	2.80*i*	.....	....	31.00*hi*	46.00*hi*	2.76	3.44*i*	.282*im*	.....
New Orleans	4.229‡*k*	2.52	2.52	.05	.10	19.00	21.00	1.82	1.35	1.91	2.875
New York	3.75	2.76*c*	2.76*c*	.....	.15	17.50	19.50	1.76	1.32	1.81	2.74
Philadelphia	3.666	3.668	....	.....	....	19.50	21.50	1.71	1.28	1.79	2.72
Pittsburgh	2.10*a*	2.15*a*	2.15*a*	.02½	.10	23.00	26.50	1.59	1.20	1.67	2.40
St. Louis	3.697	2.74	2.74	.0	.05	28.00	34.00	1.69	1.27	1.78	2.70
San Francisco	4.35	2.825	2.675	.02½	.10	21.00	24.50	1.93	1.42	2.03	3.70
Seattle	2.75*e*	2.80*e*	....	.....	....	34.50	38.50	1.93	1.42	2.03	2.95*e*

‡ Delivered. *a* Mill prices. *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight. *e* F.o.b. dock. *f* Includes delivery in free delivery zone. *g* Less than 1 ton, add 25c.; 1 to 5 tons, add 10c. * High scrap steel prices cut former 15c. differences between new billet and rail steel in many mills. *h* List price. *i* Plus Dominion and Province sales tax. *k* Quotation on changed basis; no actual price change. *m* per. sq. yd.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in to 24 in.*a*	VITRIFIED SEWER PIPE Per foot, std. 8 in., s.s.	Delivered std. 12 in., s.s.	ASTM 24 in.,	C13–35 36 in.	CLAY DRAIN TILE Per 1,000 ft. carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered; ASTM 12 in.	C 14–35 24 in.	WROUGHT STEEL PIPE Full standard weight, *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in.; Lap Weld Black %	Galv.
Atlanta	$50.66	$0.26*b*	$0.468*bc*	$1.8525*c*	$4.68*c*	$85.00	$128.00	$0.45	$1.642	48.2	34.2	39.7	5%2
Baltimore	54.00	.35	.60	2.70	7.25	160.00	200.00	.60	1.85	65.5	57.5	63.0	51.5
Birmingham	46.00	.275	.495	1.95	5.50	100.00	220.00	.50	1.70	62.2	54.2	59.7	541.2
Boston	56.40	.371*r*	.7155*r*	2.79*r*	7.6875*r*	170.00‡*r*	265.00‡*r*	.60	1.95	....	....	....	....
Chicago	55.33	.35	.675	2.70	7.00	100.00‡	150.00‡	.45	1.85	66.0	55.0	64.5	53.0
Cincinnati	54.27	.231	.4455	1.80	5.125	105.00‡*s*	170.00‡*s*	.75*t*	1.75*t*	57.1	43.4	54.0	39.6
Cleveland	55.75	.245*r*	.4725*r*	2.115*r*	5.535*r*	90.60	139.40	.36	1.38	68.5	57.5	66.0	54.5
Dallas	57.43	.31	.58	2.25	5.00	90.00	110.00	.46	1.57	....	....	....	....
Denver	62.56	.29†	.52†	2.16†	3.00*n*	125.00	200.00	1.00	2.22	58.4	50.4	55.7	47.2
Detroit	55.75	.385	.7425	2.925	7.75	170.00*u*	260.00*u*	.36	1.75	57.6	44.0	54.5	40.2
Kansas City	56.73	.35	.59	2.20	6.20	140.00	260.00	.45	1.60	35.6	46.1	46.2	59.4
Los Angeles	69.40	.325†	.585†	2.70†	6.75†	130.50	217.50	1.00	2.00	61.1	50.1	58.6	47.1
Minneapolis	60.10	.305†	.549†	2.196†	6.25†	.....	.....	.90	2.10	64.2	53.2	60.7	49.2
Montreal	67.00	.85*o*	1.50*o*	5.25*p*	8.50*ep*	45.00*m*	64.00*m*	.48*m*†	1.92*m*†	....	....	....	....
New Orleans	52.78	.37*r*	.78	1.69	....	150.00	220.00	.45	1.65	62.4	54.4	58.8	50.3
New York	53.40	.308	.594	2.52	6.45	.....	.....	.60	1.40	64.9	53.9	62.4	50.9
Philadelphia	52.00	.35	.675	2.75	7.50	165.00	225.00	.45	1.75	56.6	42.8	53.6	39.1
Pittsburgh	57.00	.266†	.513†	2.295†	5.945	97.80	154.20	.85*g*	2.00*g*	68.5*i*	57.5*i*	66.0*i*	54.5*i*
St. Louis	54.62	.32	.576	2.304	6.00	100.00	260.00	1.00*j*	2.15*k*	56.4	42.6	52.5	38.4
San Francisco	69.40	.3625*d*	.6525*d*	2.61	6.52	115.00	192.50	.58	2.34	45.0	31.0	41.0	26.0
Seattle	71.20	.40	.72	2.88	7.20	115.20	.....	.51*f*	1.44*f*	....	....	....	....

‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $49.00. Based on existing freight rates; subject to rate change. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* 30-inch. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list consumers carload prices, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92 3 per cent tax on transportation costs not included. *i* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less on butt, 1½ on lap. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base prices and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base. Butt-weld—1 in. and 1¼ in. black 34, galv. 16; 1½ in. black 38, galv. 18½; 2 in. black 37½, galv. 18. Lapweld—2½ in. to 3½ in. black 31½, galv. 14½; 4½ in. to 8 in. black, 32½ galv. 17. *j* Reinforced; spec. C 76–37. *k* Reinforced; spec. C 75–37. *l* Plus sales tax. *m* Tax included. *n* 27-in. pipe. *o* Less 50%. *p* Less 53%. *r* Truck delivery. *s* Price quotations on delivered basis since Mar. 1940; current f.o.b. price $84 for 6 in.; $130 for 8 in. *t* Reinforced pipe prices since May, 1937; current plain pipe prices are: 12 in., 36c.; 24 in., $1.53. *u* Scarce; carload quantities not readily available.

Help REDUCE the High Accident Toll!

make SAFE roads and streets your number 1 objective

In spite of war speed restrictions and less traffic, motor vehicle accidents reached the appalling toll of 23,400 deaths and 800,000 injuries in 1943. Reducing these terrifying figures is a responsibility that must be shouldered. Make it your NO. 1 objective!

While many of the accidents were due to other reasons . . . a high percentage were caused either by some specific defect in the roadway itself or by unfavorable surface conditions. Wet, muddy, snowy or icy roads and streets alone are said to be responsible for one out of every five or six fatalities!

Wider, skid-proof surfaces, flatter slopes and ditches, increased sight distances on curves and hills, more intense maintenance . . . these are essential to accident-proof roads and streets. And modern, cost-cutting equipment is essential to accomplish these objectives on a limited budget! Figure on fast, powerful Allis-Chalmers 2-Cycle Diesel Motor Graders and Tractors to get the most done for the least money.

Watch 2-Cycle.. the Modern Diesel

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Fight to Victory with War Bonds

LUMBER, TIMBER PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better end for No. 1 N. C. Box. (Prices in Bold Face) — All Fir planks No. 2 common, Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)									LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base size)	
	1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 Rgh	6x12 Rgh	12x12 Rgh	2x12 Rgh	12x12 Rgh	¼"	⅜"
Atlanta	**$40.00**	**$40.00**	**$32.00**	**$35.00**	**$34.00**	**$37.00**	**$46.00**	.....	.....	$57.00	$64.00	$17.90	$21.95
Baltimore	**44.00**	**46.00**	**44.00**	**46.00**	**47.00**	**52.00**	**65.00**	.....	.....	115.00	120.00	18.25	22.35
	48.00	*49.00*	*55.00*	*55.00*	*55.00*	*57.50*	*68.00*	*$75.00*	*$75.00*	.....	.....		
Birmingham	**45.00**	**45.00**	**44.50**	**43.50**	**44.50**	**47.50**	**68.00**	**55.00**	**56.00**	.....	.....	17.35	21.35
[1]	50.00	50.00	49.50	48.50	49.50	52.50	72.00	.....	.....	67.50	70.00		
Boston	**60.00**[3]	**60.00**[3]	**60.00**[3]	**60.00**[3]	**60.00**[3]	**62.00**[3]	**66.00**[3]	.....	.....	**58.00**[g]	**58.00**	18.25	22.35
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*54.00*	*58.00*	*58.00*	*58.00*	.....	.....		
Chicago	**54.00**	**54.00**	**55.00**	**54.00**	**54.00**	**60.00**	**68.00**	.....	.....	**80.00**[f]	**95.00**[f]	14.60	17.80
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*55.00*	*56.00*	*57.00*	.....	.....	.....		
Cincinnati	**47.50**	**49.00**	**42.50**	**42.50**	**42.50**	**44.50**	**67.00**	.....	.....	**65.00**	**65.00**	17.35	21.15
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
Cleveland	**42.50**[k]	**42.50**[k]	**52.50**[k]	**51.00**[k]	**65.00**	**65.00**	**83.00**	**83.00**	**83.00**	.....	.....	17.75	21.60
Dallas	**45.25**	**45.25**	**44.50**	**43.00**	**43.00**	**47.25**	**60.75**	**58.75**	**58.75**	**88.75**	**85.00**	14.60	17.80
Denver	**63.50**[4]	**62.00**[4]	**65.00**[4]	**65.00**[4]	**65.00**[4]	**66.00**[4]	**69.00**[4]	*83.00*	*89.00*	.....	.....	10.45	12.70
Detroit	**61.00**	**61.00**	**57.75**	**57.75**	**57.75**	**63.75**	**71.00**	.....	**90.00**	**70.75**	**90.00**	17.35	21.15
	57.00	*57.00*	*57.00*	*57.00*	*62.75*	*72.75*	*75.00*	*75.00*	*90.00*	.....	.....		
Kansas City	**69.00**	**69.00**	**67.00**	**65.50**	**67.00**	**69.00**	**84.00**	.....	.....	**84.00**	**94.00**	12.60	15.40
	66.00	*66.00*	*59.50*	*59.50*	*59.50*	*59.50*	*75.00*	*80.00*	*80.00*	.....	.....		
Los Angeles	*60.00*	*60.00*	*60.50*	*60.75*	*59.25*	*59.25*	*72.75*	*72.00*	*72.00*	.....	.....	9.90[h]	12.00[h]
Minneapolis	**59.00**[4]	**59.00**[4]	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.60	15.40
[‡]	*58.00*	*58.00*	*57.00*	*57.25*	*56.25*	*57.00*	*64.75*	*65.50*	*65.50*	.....	.....		
Montreal	*58.00*	*61.00*	*54.00*	*58.00*	*60.00*	*66.00*	.....	.....	.....	**200.00**	**200.00**	.....	.....
	54.00	*54.00*	*57.00*	*57.00*	*57.00*	*58.75*	*68.00*	*68.00*	*68.00*	.....	.....		
New Orleans	**40.00**	**40.00**	**37.00**	**35.00**	**34.00**	**36.00**	**46.00**	.....	.....	**55.00**	**69.00**	14.60	17.80
	31.00	*31.00*	*33.00*	*31.00*	*34.00*	*32.00*	*33.00*	.....	.....	.....	.....		
New York	**67.50**	**67.50**	**62.50**	**62.50**	**62.50**	**64.00**	**74.00**	.....	.....	**120.00**[f]	**125.00**[f]	18.35	22.25
[‡]	.....	.....	*65.00*[i]	*65.00*[i]	*65.00*[i]	*65.00*[i]	[Range from $75 to $95]			.....	.....		
Philadelphia	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	.....	.....	**130.00**	**130.00**	18.25	22.25
	75.00	*75.00*	*75.00*	*75.00*	*75.00*	*75.00*	*85.00*	*90.00*	*90.00*	.....	.....		
Pittsburgh	**50.80**	**53.20**	**62.75**	**55.00**	**60.85**	**62.50**	**76.25**	.....	.....	.....	.....	18.10	22.05
	69.20	*68.10*	*66.10*	*65.30*	*65.20*	*65.65*	*82.75*	*88.75*	*88.75*	.....	.....		
St. Louis	**61.00**	**61.00**	**57.00**	**56.00**	**57.00**	**59.00**	**71.00**	*75.00*	*75.00*	**87.00**	**87.00**	14.60	17.80
San Francisco	*41.00*	*41.00*	*36.50*	*36.75*	*35.75*	*35.75*	*37.50*	*38.00*	*38.00*	.....	.....	7.30[j]	8.90[j]
Seattle	*45.50*	*45.50*	*44.50*	*44.50*	*43.25*	*43.25*	*43.50*	*43.00*	*41.75*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers, N. C. Pine. [3] Spruce. [4] Native. [5] Western Pine, No. 3 Common. [7] Spruce. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors discount in Minneapolis and St. Paul discontinued May 21, 1938. *c* 5M ft. or less. *d* F.o.b. cars San Francisco freight rate. *e* 10% discount taken off. *f* Up to 18 ft. † Plus sales tax.

Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface Seattle base price on ¼", $95.15; on ¾", $104.85; price includes oiling and ending charges. For other centers add rail freight increment from table or proper size. For resin dipped treatment, add $10.50 per M. *g* Lower rate by water shipment. *h* 50,000 lb. minimum. *i* Ranges from $65 to $69. *j* Average price *k* August 1943 price. *l* September price; none later available.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from jobbers list, Aug. 15, 1938 — Single or Double Thickness		EXPLOSIVES — Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*	
	A quality	B quality		
Atlanta	75%	75%	$0.15	
Baltimore	78%	79%	.15	
Birmingham	76%	76%	.105	
Boston	77%	78%	.15	
Chicago	77%	77%	.15	
Cincinnati	77–10%	77–10%	.15	Price of 60% Ammonia Gelatin in $0.01 per lb. higher than 40%
Cleveland	77%	77%	.19	
Dallas	76%	76%	.1625	
Denver	76%	76%	.155*e*	
Detroit	77%	77%	.1575	
Kansas City	77–10%	77–10%	.155	
Los Angeles	86%*d*	88%*d*	.1575	
Minneapolis	77%	77%	.155	
Montreal	40–5%*ab*	47%*ac*	.1675†	
New Orleans	70%	75%	.16	
New York	81%	82%	.22*f*	
Philadelphia	78%	79%	.15	
Pittsburgh	79%	79%	.1225	
St. Louis	77–10%	77–10%	.155	
San Francisco	66%	73%	.155	
Seattle	75%	75%	.1575†	

a Discount from list Sept. 1939; sales tax included, but 6% tax exemption not allowed for. *b* Single thickness. *c* Double thickness. *d* Discount from jobbers' list Sept. 15, 1928.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal St. add delivery charge of $6.00 per trip. [1] F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me	$0.105	$0.13	$0.15
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.11 –.1175	.135 –.1475	.155 –.1675
Rocky Mtn. States	.11 –.1225	.135 –.1525‡	.155 –.1725‡
Pacific N. W. States	.1075–.12	.1375–.15	.1575–.17
Pacific S. W. States	.1050–.1125	.135–.1425	.155–.1625

‡ F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, fir and pine, bark on, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail— Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.34	....
12 in.— 2 ft. from butt	6-in.	50 to 59-ft.	.35	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.36	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	.57[f]
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	.57[f]
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.41	.62[f]
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.43	.59
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.53	....
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	.56	....
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	.61

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

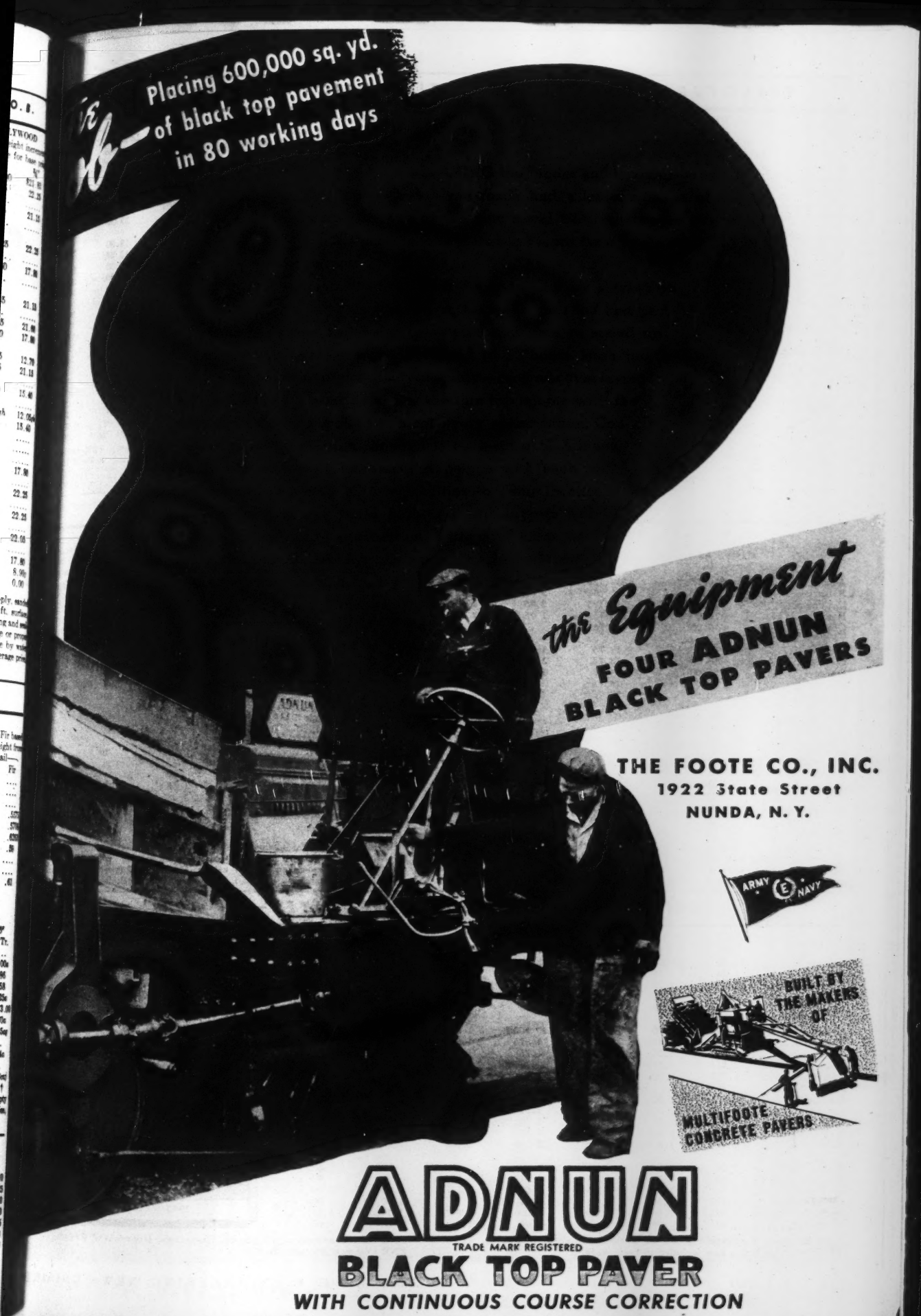
Prices f.o.b., per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	$1.50	....	$2.00	....
	Pine	2.00	$3.00*a*	2.50	$3.00*a*
New York	S. L. Sap Pine	1.43/1.54	2.59	1.76	2.86
	Mixed Oak	1.71	2.59	2.42	3.58
Birmingham	White Oak	1.00	1.60*a*	....	2.25*a*
Chicago	Red Oak	....	2.00/2.25*a*	....	2.87/3.00
Los Angeles	Douglas Fir	2.00	3.25*a*	2.90	4.70*a*
Philadelphia	Red Oak	....	2.10*ag*	....	3.25*ag*
St. Louis	White Oak	1.63	....	2.19	....
	Red Oak	1.63	2.20*a*	2.19	3.00*a*
	Sap Pine or Cypress	1.70	....	2.06	....
San Francisco	Douglas Fir	1.25*bef*	....	....	3.00*ef*
Montreal	Birch or Maple	.85	.90	....†	....†

Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 6"x8"x8'6". *c* Empty cell. *d* Zinc. *e* Green. *f* F.o.b. cars. † Out of market. *g* January 1943 prices, none later available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.50– 3.10
Chlorine cylinders, liquid, per lb., delivered	.0525
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, del'd, ton	18.50–32.00
Silicate of soda, 52 deg. in drums, f.o.b. works, per 100 lb.	1.40
Soda ash, 58%, in paper bags, per 100 lb. dense	1.35
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	23.00–25.00
Sulphate of copper, in bbl., per 100-lb.	5.00


Placing 600,000 sq. yd.
of black top pavement
in 80 working days
the Equipment
FOUR ADNUN
BLACK TOP PAVERS
THE FOOTE CO., INC.
1922 State Street
NUNDA, N. Y.
ARMY E NAVY
BUILT BY
THE MAKERS
OF
MULTIFOOTE
CONCRETE PAVERS
ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER
WITH CONTINUOUS COURSE CORRECTION

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity. Common backing	Straight hard	LIME Per ton, Hydrated finishing	In paper, Common hydrated	Carlots Pulverized or lump
Atlanta	$104.00	$114.00	$199.00	$234.00	$244.00	$250.00	$17.00	$20.04	$26.54	$15.04	$18.00
Baltimore	84.00	90.00	170.00	200.00	260.00	300.00	16.00*k*	20.00*k*	19.00	14.00	20.00
Birmingham	80.00	85.00	160.00	191.00	252.00	288.00	14.50	17.00	18.11	13.64	20.00
Boston	103.75*a*	110.65*a*	207.45*a*	248.90	.....	.....	20.00*i*	20.00*i*	21.00†	.....	25.00
Chicago	79.50	85.00	160.00	197.00	243.00	278.00	15.00	16.00	17.00	15.00	18.00
Cincinnati	65.55	69.90	131.20	148.70	210.35	240.45	25.75	25.75	15.50	13.00	16.00
Cleveland	82.50	97.35	182.50	.....	.....	.....	20.00	20.00	15.75*j*	13.25*j*	18.00
Dallas	71.40	76.70	145.30	183.50	238.00	294.50	15.25*i*	16.75*i*	19.00	15.00	17.00
Denver	84.80	95.40	153.70	178.20	212.00	227.90	14.50	18.00	25.00*j*	17.00*j*	20.00
Detroit	92.70	96.70	181.20	206.75	267.50	306.00	20.50	20.50	18.00	16.00	18.00
Kansas City	67.00	69.00	89.00*c*	128.00	163.00	189.00	17.00	18.00	19.32	13.00	16.00
Los Angeles	73.50†*r*	89.50†*r*	128.00*c*†*r*	210.00†*r*	368.00†*r*	460.00†*r*	13.50	15.00	16.50	17.50	17.50
Minneapolis	87.00*b*	92.80*b*	157.30*b*	.....	189.00*b*	262.00*b*	25.50	27.50*g*	21.00	16.00	19.00
Montreal	94.55*a*	100.45*a*	199.50*a*	160.45*a*	109.40*at*	137.40*av*	21.08†*u*	28.35†*u*	24.60*u*	18.00*u*	20.00
New Orleans	72.00	72.00	135.00	162.00	210.00	260.00	14.00	.....	18.30	12.08	14.10
New York	90.80	96.80	133.10*e*	219.80*h*	269.80*h*	333.90*h*	17.50/18.50	.....	20.00	14.00	17.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	17.00	20.00	19.00	16.00	18.00
Pittsburgh	72.85	78.55	147.25	163.75	217.50	231.00	20.50	22.50	17.90	15.40	18.00
St. Louis	67.00	72.00	130.00	190.00	244.00	290.00†	20.50	19.50	22.00	18.00	23.00
San Francisco	96.00	108.00	144.00	108.00*t*	.....	.....	21.50	.....	24.00	23.00	26.00
Seattle	115.00	125.00	230.00	.....	.....	.....	20.50*f*	24.00*f*	20.00*s*	20.00*s*	26.00

† F.o.b. *a* Smooth. *b* Carload lots delivered to job. *c* 6x12x12 in., 3-cell. *d* Not load bearing. *e* 48 lb. tile. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* F.o.b. Warehouse only. *j* LCL. *k* $1.00 discount if paid in 10 days. *l* Lump. *m* Per bbl., 180 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *r* 5% discount 10 days. *s* 2% discount cash. *t* 5½x8x12. *u* 8% sales tax included. *v* 6x12x12-in. *w* Per 200 lb. *x* Sept. 1944 prices, Oct. not available on tile.

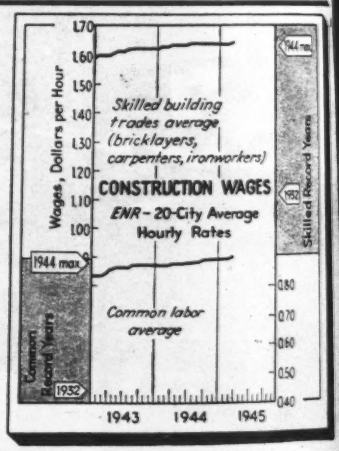
PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *b*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$10.25	$14.125	$1.30	$2.25	$1.20	$1.90	$1.61	$1.61	$0.27	$30.00
Baltimore	10.00	13.75	2.00	3.00	2.50	2.30	2.70	2.70	.40	29.00
Birmingham	10.25	14.125	2.35	3.50*r*	1.98*r*	2.10	2.03	2.03	.32	28.00
Boston	10.00	13.75	1.75	2.50	2.31	2.00‡*h*	3.30‡*w*	3.30‡*w*	.25‡	21.00
Chicago	10.00	13.75	....	....	....	1.75*h*/	1.74*h*/	1.82*h*/	.33/	23.00
Cincinnati	10.00	13.75	1.70	2.90	1.60	2.20	2.10*h*	2.10*h*	.33	25.00
Cleveland	10.00	13.75	1.70	2.90	1.60	1.93	1.83*h*	1.83*h*	.25	27.00
Dallas	10.00	14.50	1.88	2.11*n*	.05*l*	1.75*h*	1.66*h*	1.66*h*	.35	39.00
Denver	10.50	14.25	....	....	.27*l*	2.45	2.95	2.95	.35	28.00
Detroit	10.00	13.75	1.75	3.00	1.60	2.25	2.25	2.25	.50	23.00
Kansas City	10.00	13.875	2.30*g*	2.55*gr*	2.16*g*	2.19	2.30	2.30	.28	27.50
Los Angeles	10.25	14.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	10.00	13.875	....	....	....	1.8025*i*	1.7098*hi*	1.7098*hi*	.32	23.00
Montreal	.....	11.05	2.50*p*	4.90*p*	3.15*p*	4.02*t*	2.58*t*	3.01*t*	.89*t*	2.10*t*
New York	10.00	13.75	2.03	....*r*	1.82	1.7098	1.6273*o*	1.6273*o*	.26	23.00
Philadelphia	10.00	13.75	1.60/1.80	2.20*r*	1.55	1.75	1.66	1.66	.32	23.00
Pittsburgh	10.00	13.75	1.05	1.95	.80	1.95	1.84*h*	1.84*h*	.34	26.00
St. Louis	10.00	13.75	2.25*s*	2.80*s*	1.96*s*	2.05	1.93	1.93	.34	24.00
San Francisco	10.25	14.00	1.80	2.75*n*	1.35	1.71	2.40	2.40	.33	20.50
Seattle	10.25	14.25	1.90	3.00	....	2.15	2.15*h*	....	.35	26.50

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* Subject to 25% discount. *f* Distributors' price to contractors. *g* 5 gal. can. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Asphalt pitch. *k* Per 100 lb. *l* Per lb. *m* Per bbl. *n* May, 1941 price. *o* 60-lb. roll. *p* Plus 8% sales tax. *r* Not available, except on priority rating; then quoted specially. *s* December 1942 price. *t* Federal tax included. *u* 90-lb. roll. *v* Truck delivery.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor—Building	Common Labor—Heavy Const.
Atlanta	$1.50	$1.25	$1.50	$1.25	$1.50	$0.40	$0.50
Baltimore	1.75	1.4375	1.80	1.625/2.00	1.725	.80	.80
Birmingham	1.75	1.25	1.50	1.25/1.50	1.50	.65	.65
Boston	1.625	1.50	1.65	1.50/1.875	1.667	1.00	1.00
Chicago	1.75	1.70	1.76	1.75	1.825	1.10	1.10
Cincinnati	1.875	1.50	1.675	1.40/1.55	1.625	.85	.85
Cleveland	1.875*c*	1.575	1.875	1.875	1.875	1.085	1.125/1.155
Dallas	1.625	1.25	1.50	1.75	1.625	.60	.75/1.25
Denver	1.65*b*	1.50*b*	1.50*b*	1.50/1.625*b*	1.50/1.65	.80*b*	.80*b*
Detroit	1.725	1.50	1.825	1.675/1.825	1.725	1.00	1.00
Kansas City	1.75	1.50	1.625	1.675	1.70	.975	.90
Los Angeles	1.50	1.35	1.625	1.375	1.667	.875	.875
Minneapolis	1.625	1.44	1.625	1.50	1.625*e*	.95	.95
New Orleans	1.50	1.25	1.50	1.50	1.375	.65	.75
New York	2.00*b*	1.85*b*	2.00	2.00*b*	2.00*b*	1.10*f*	1.00
Philadelphia	2.00	1.58	2.00	2.00	2.00	.825	.825
Pittsburgh	1.90	1.75	1.75	1.8125	1.875	.90	.80
St. Louis	1.75	1.50	1.75	2.00	1.75	1.00	1.00
San Francisco	1.875	1.50	1.75	1.50/1.75	1.75	1.00	1.00
Seattle	1.845	1.565	1.745	2.00	1.865	1.145	1.145
Montreal*	1.05	.95	1.00	.90	1.00	.60	.65



b 7 hr. day. *c* Prevailing rate on government work. *e* 35 hr. wk. *f*
* Cost of living bonus now included in basic wage.

ENR Skilled Average; (Bricklayers, Carpenters, Ironworkers) $1.643.
ENR Common Average; $0.895.

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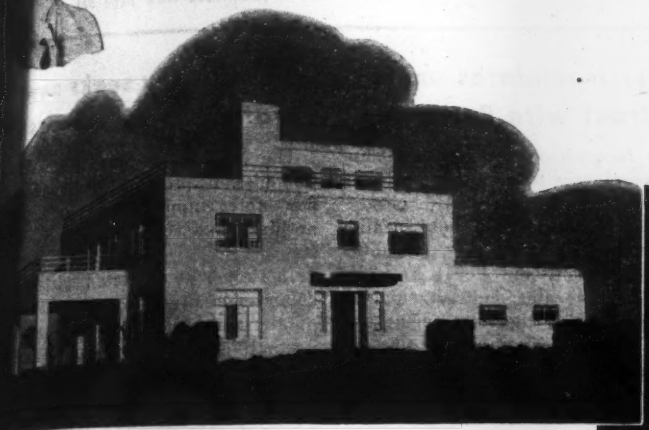

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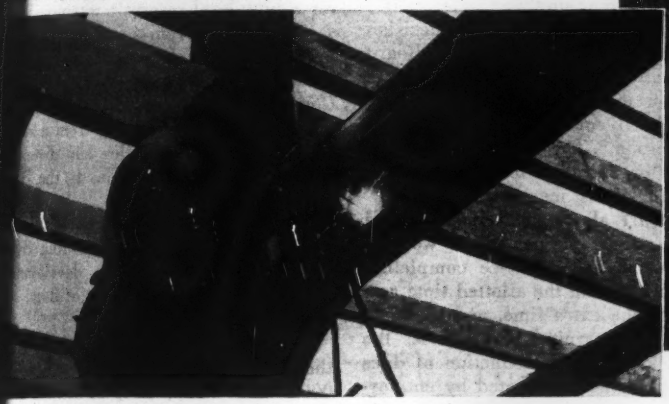
...ROVES THE BUILDING. Design for welded steel construction opens ... door to unlimited ingenuity . . . provides the key to *better* ...*pearance, lower operating cost, greater strength and* ...*ety*. This 12-room welded steel home in Wichita Falls, Texas, ... many unique features.



...WERS THE COST. Welded design *simplifies* detailing, fabrication and erec-...on; *cuts tonnage*. On this structure for a factory building of 50,000 sq. ft. ...oor area, it cut steel weight 30% . . . cut fabrication cost about $10 per ton ... compared to riveted construction.

SIMPLIFIES THE PROBLEMS. For example on this job —an addition to an office building: Arc welding permitted a tie-in to the existing structure by simply removing masonry from the face of the column and welding the new steel to it. Moreover, tenants were undisturbed because *arc welding is quiet*.

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The Week IN ENGINEERING AND CONSTRUCTION

(Continued from page 92)

Court invalidates union contract with Baltimore

While recognizing the right of municipal employees to organize and deal collectively, the Baltimore, Md. circuit court, in a recent decision, held invalid a labor contract between the city public works department and Local No. 825 (AFL) because the contract, signed last April, denied the department the right to bargain with any other organization.

The court pointed out that "The contract would not be objectionable if it merely gave to the union the right to act as bargaining representative for its members, saving to the other employees of the department the full right to deal with the department on their own behalf either singly or collectively."

Two days after the court decision was handed down, the Baltimore Board of Estimates signed a new contract with the union incorporating every feature of the April contract, except the one in contention. The new contract permits any organization to bargain for or on behalf of its members.

The court also upheld the so-called "task" system for per diem workers under which an employee completing a task in less than the allotted time gets credit for the extra time, and thus can increase his earnings. Likewise, the court held valid the deduction of dues by the city when requested by employees.

Hartford recognizes employee unions

A few days after the Baltimore circuit court had handed down its decision, the city council of Hartford, Conn. adopted by a 19 to 1 vote an ordinance permitting municipal employees to join unions, but with a clause inserted prohibiting strikes. The ordinance also prohibits discrimination against any employee who joins a union, and authorizes the mayor to intervene in a dispute between the union and any department of the city if he deems it desirable or necessary in the interests of the city. This action came after several months of public hearings by the ordinance committee.

All departmental administrative heads were ordered to establish in their departments "effective machinery whereby grievances, complaints, problems or suggestions" may be presented by the union organization.

New Jersey seeks new water supply sources

The New Jersey State Water Policy Commission proposes development of new water supply sources in both the northern and southern sections of the state.

In a report to the state Legislature the commission urged immediate action to obtain land necessary for storage areas, estimating the cost of land purchase and clearing of sites at $2,000,000.

The commission proposed a North Jersey project to yield 25,000,000 gpd at first and 145,000,000 gal. when fully developed. Purchase of the Round Valley site in Hunterdon County for an intermediate level supply and the Dock Watch Hollow site in Somerset County for a high-level reservoir was urged.

Flood waters from the north and south branches of the Raritan River and the Musconetcong River would be used. Construction considered includes a tunnel nearly five miles long from a catch basin near Middle Valley and diversion pipelines another 12 miles to the Dock Watch Hollow reservoir.

In South Jersey the Great Egg Harbor, Batsto, Mullica and Wading rivers would be included in a development calling for the impounding of flood season waters.

Legislation has been introduced in the Legislature to establish a $26,000,000 water supply project for the northern section of the state.

The bill, sponsored by Senator H. Rivington Pyne of Somerset County, declares that an emergency exists in the supply of industrial and potable water of the heavily populated section.

The proposed program requires construction of a reservoir at Dock Watch Hollow to be fed by the North Branch of the Raritan River at a cost of $15,000,000. In addition the existing Wanaque Reservoir would be fed by the Ramapo River under a companion project to cost $11,000,000.

Construction of the additional water supply would be under the supervision of the North Jersey Water Supply Commission, which now has charge of Wanaque Reservoir, and by four new state commissioners. To start construction, the bill provides that the state advance $8,000,000 to be paid back at one and one-half percent interest. Production of the proposed projects is estimated at 50,000,000 gpd.

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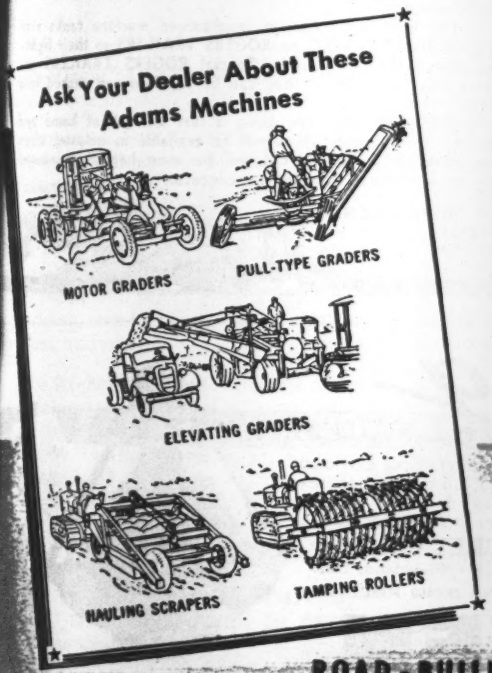

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Elections and Activities

William Comte has been elected president of the Toledo Building Congress, Inc. Others elected are: William Brown, first vice-president; James Findley, second vice-president; Joseph Dersher, third vice-president; and Carl Zenz, fourth vice-president. Clarence F. Hammer is secretary-treasurer, and C. Meng, assistant secretary.

The following officers for the Springfield chapter of the Illinois Association of Highway Engineers have been elected: R. T. Leslie, president; R. B. Murphy, vice-president; C. N. Bullard, secretary; Lumer Olsan, treasurer; C. E. Chenoweth, sergeant-at-arms; J. R. Shelburne, retiring president, director.

J. G. Bennett has been elected president of the Building and Construction Industries Exchange of British Columbia. A. J. Armstrong, was elected vice-president, and Fred Welsh, second vice-president. J. Tucker, F. J. Hale and R. C. Pybus, were elected directors.

Ralph A. Smallman, Birmingham, is president of the Alabama branch, Associated General Contractors. Other officers are: D. M. Prayter, Birmingham, first vice-president, Robert Dethlefs, Anniston, second vice-president, J. B. Rawls, secretary, and W. E. Morris, treasurer.

Herbert J. O'Connell of Montreal has been reelected president of the Quebec Road Builders Association.

Committee chairmen of the Mahoning Valley Society of Professional Engineers, Youngstown, Ohio, are: L. T. Fawcett, postwar planning; Oscar F. Gayton, membership; Chester V. Long, program; Harry D. Coe, publicity and public relations; Brooks Church, auditing; and W. T. Williams, attendance.

J. L. Carroll, has been elected president of the Engineer's Club of Mobile, Ala., succeeding E. A. Benson. Other officers are: J. P. Trotter, vice-president; H. A. Linstrom, secretary-treasurer; P. H. Kimmer, public relations director; and A. J. Miller, membership and welfare director.

Allan C. Slade, Franklin County engineer, is the new president of the County Engineers Association of Ohio. Others elected are: Harry L. Dittmer, Trumbull County, vice-president; Walter F. Jacobs, Portage, secretary; and Delos J. Nisson, Ottawa, Walter E. Rusk, Richland, Paul C. Shafer, Portage, George E. Arnold, Tuscarawas, Claude F. Skidmore, Union, Zoyd M. Flaler, Mercer, T. C. Freshour, Miami, Robert E. Willis, Fayette, Leon E. Wolford, Fairfield, and Cecil W. Stacy, Washington County, trustees.

William Joshua Barney, president of the W. J. Barney Corp., has been elected president of the New York Building Contractors and Mason Builders Association. He succeeds E. P. Corning. Other officers are: Webster J. Caye, first vice-president; Harry J. Stellmann, second vice-president, and Hugh M. Hughes, treasurer. Directors are: Carl Brandt, W. C. Bradbury, F. E. Schilling, John Eisele, Fred Driscoll, W. B. Wainwright and J. W. Escher.

George A. Pierce, commissioner of public utilities, Jacksonville, Fla., has been re-elected president of the Florida Municipal Utilities Association. Others

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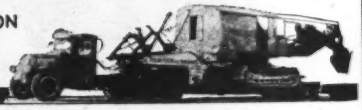

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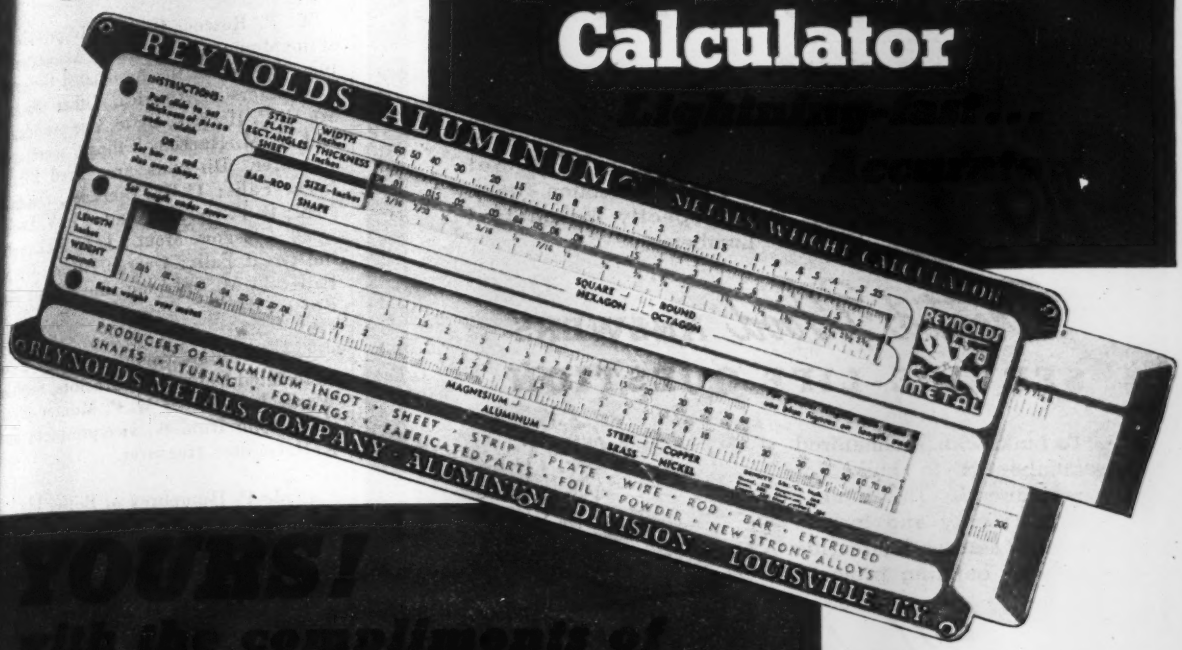

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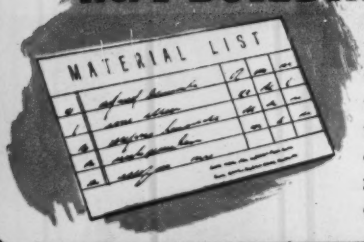

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elected are Harry W. Damerow, superintendent of Public Works at Vero Beach, Fla., vice-president; M. W. Brown general manager of the Orlando, Fla., utilities commission, secretary-treasurer.

W. P. Roscoe, Billings, is president of the Montana Contractors' Association, Inc., chapter of the Associated General Contractors of America. Other officers are R. P. Herrick, Butte, vice-president, and H. M. Hansen, Billings, secretary-treasurer. Directors are: Fred Birch, Great Falls; C. H. Bjerknes, Omaha, Neb.; R. P. Herrick, Butte; L. V. Lockwood, Glasgow, Mont.; J. L. McLaughlin, Great Falls; George Nilson, Great Falls; L. M. Sheridan, Butte, and Mr. Roscoe.

The Mountain-Pacific chapter of the Associated General Contractors, Seattle, Wash., has elected M. P. Munter president, John Rumsey, vice-president and K. S. Goulter, treasurer.

Clyde P. Humphrey of Boise, Ida., is the new president of the Idaho Society of Engineers. Other officers: James Reid, Lewiston, vice-president; W. P. Eaton, Boise, secretary, and H. C. Clare, Boise, treasurer.

At the 27th annual meeting of the Canadian Construction Association in Quebec City recently H. C. Nicholls, of Milne and Nicholls, general contractors, Toronto, was re-elected president. There were addresses on Canada's wartime construction controls, the Alaska Highway, and the work of the War Assets Corp., Canadian government disposal agency, headed by an ex-construction man, J. B. Carswell.

William H. Heim, Seneca County, Ohio, engineer, has been elected president of the Sandusky-Ottawa-Seneca Professional Engineers Association.

S. D. Buzzelle, Vancouver, B. C., has been elected president of the local Building Contractors' Association and Cecil Sharpe vice-president. Directors are W. P. Perkins, G. B. Groome, A. Grayson and George Sinclair. Directors for the trade sub-divisions are Tom Mullard, Peter Lakes and George Pickett.

Joseph G. Hermann, Newport, has been elected president of the Kentucky Society of Professional Engineers, succeeding A. E. Marye, Louisville.

Other officers are: W. R. McIntosh, Louisville, first vice-president; R. C. Page, Lexington, second vice-president; C. S. Crouse, Lexington, re-elected secretary-treasurer. Directors are: H. L. Casner, Madisonville; W. W. Saunders, Louisville; H. A. Spalding, Hazard, A.

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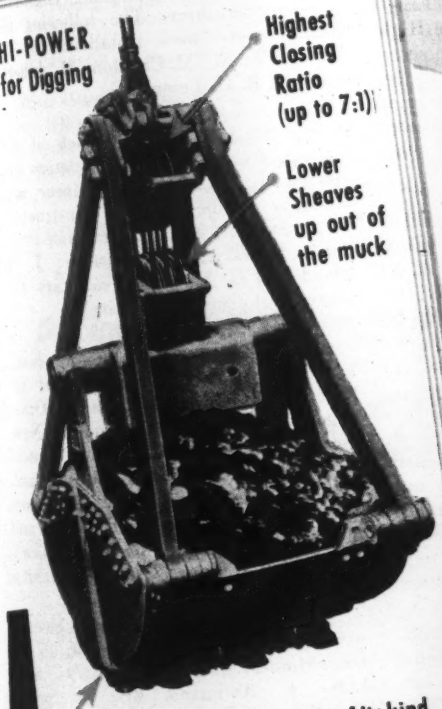
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E. Marye, J. P. Brownstead, Ashland; C. W. Lovell, Louisville, M. J. McGruder, and State Highway Commission J. Stephen Watkins, Lexington.

The Ontario General Contractors Association has elected W. J. Bradford, of Bradford-Hoshal Ltd., general contractors, Toronto, president to succeed T. N. Carter. R. W. Johnstone, of Anglin Norcross Ltd., Toronto, was elected honorary treasurer, and W. S. P. Hannaford, honorary secretary. R. L. Moran continues as executive secretary.

Donald MacIsaac has been installed as president of the Southern California Chapter, Associated General Contractors of America, succeeding E. S. McKittrick. Other officers are George A. Herz, John A. Kier and Harry Coon, vice-presidents, and R. J. Daum, treasurer, re-elected.

The board of directors includes, besides the new officers, McKittrick, Ed Davis, Franz Fohl, Frank Wood, J. S. Reynolds, G. W. Abernathy and Ray B. Best.

The New Mexico chapter of the American Society of Civil Engineers has elected Donald C. Bondurant, president. He is a member of the United States Army Engineers' force in Albuquerque. He succeeds John H. Bliss of Santa Fe. Others elected were William G. Bratschi, Santa Fe, first vice-president; Harold B. Elmendorf, Albuquerque, second vice-president; and Ernest B. Bail of the New Mexico State Highway Department, Albuquerque, secretary-treasurer. Herbert W. Yeo, former state engineer and a civil engineer in New Mexico since 1907, was initiated as the first life member of the state chapter.

Albert A. Powell has been elected president of the Albany, N. Y., Society of Engineers. Other officers are: A. L. Rumsey, first vice-president; V. L. Ostrander, second vice-president; H. S. Chartier, third vice-president; T. L. Stickley, librarian, and Stephan A. Bunting, secretary-treasurer.

J. C. Boespflug has been named president of the Seattle chapter, Associated General Contractors. Don Mowat was named vice president, O. B. Daniels secretary and John Sellen treasurer. J. B. Warrack and George Teufel were re-elected to the executive committee.

The Toledo, Ohio, Technical Council, composed of 16 affiliated organizations with a membership of over 1,200, has elected the following officers for 1945: Sydney Bevin, president; Charles C. Eeles, vice president; and Joseph A. Reece, secretary-treasurer.

J. Francis War, recently engaged in designing housing projects for the government, has been elected chairman by the Building Industry Conference Board of San Francisco, Calif. Other officers are: Howard C. Wood, civil engineer, one of the designers of the San Francisco-Oakland Bay Bridge, vice-chairman; and Wm. E. Hague, manager of the Central California Chapter of the Associated General Contractors of America, Inc., honorary secretary.

Spokane Chapter, Associated General Contractors has elected the following officers: S. G. Morin, president; J. J. Scherr, vice-president; Carl Carboe, vice-president; C. H. Ludberg, director, and Oscar Nyberg, director.

The Associated Pennsylvania Constructors has re-elected James J. Skelly of Media, president. Other officers elected are: H. D. Maxwell, Easton, vice-president at large; S. Howard Brown, Grantville, treasurer; and A. E. O'Brien, Harrisburg, executive secretary.

The San Jacinto Chapter of the Texas Society of Professional Engineers at Houston, Tex., has installed the following officers: C. L. Shirley, Defense Plant Corp., supervising engineer, president; W. H. Balka, consulting engineer, first vice-president; J. Daviss Collett, Jr., consulting engineer, second vice-president; O. O. Wells, Houston city water department designing engineer, secretary-treasurer, The following directors were also installed: M. T. Works, W. W. McClendon, M. Albertson, and R. H. Peters.

The St. John, N.B., branch of the Canadian Construction Association has elected J. P. Mooney, engineer and manager of the Mooney Construction Co., president, T. P. Larsen, vice-president; H. O. Clark, treasurer; J. N. Flood and G. M. Flood, secretary and sergeant-at-arms, respectively.

Grant A. Stannard of Wichita, Kan. has been re-elected president of the Kansas Contractors Association. Other officers are: Ralph H. Rhoades, Newton, vice-president; C. L. Burt, Hutchinson, treasurer; and J. W. Ballard, Topeka, engineer-secretary. Directors are: Messrs. Stannard, Rhoades and Burt, together with E. W. Geiger, Leavenworth; and Edgar Stewart, Wichita.

Ralph W. Tuller has been elected president of the Engineers Club of Des Moines, Ia. Other officers are: Lloyd E. Anderson, first vice-president; Erwin F. Behrens, second vice-president; Eugene B. Fowler, third vice-president; and Monroe L. Patzig, secretary-treasurer.

DOLLARS DOWN TO EARTH

BUDGET-SAVERS—these Blue Brutes! When postwar construction plans come down to earth, they'll keep down costs on jobs like this:

Pittsburgh's $36,000,000 public works program including $4,719,550 for water mains, $9,142,500 for streets, $3,494,000 for sewers.

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Look 'em over now; plan now to get more worth from air with Worthington. Your nearest Blue Brute distributor is listed on page 148.

*Reg. U. S. Pat. Off.

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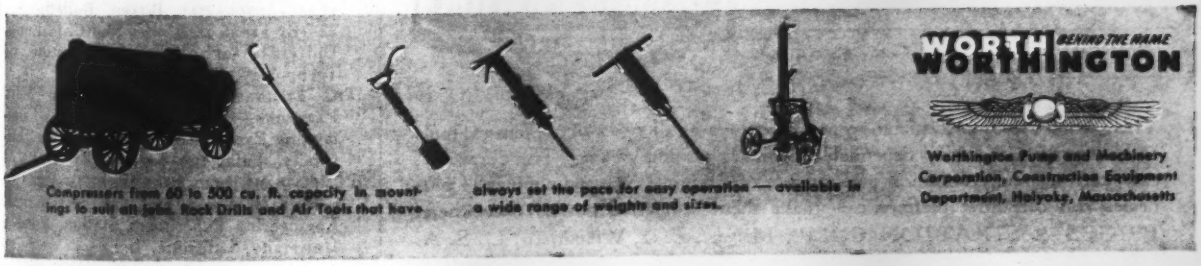
Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.
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BRIGGS & STRATTON CORP., Milwaukee 1, Wisconsin, U. S. A.

New Engineering Books

(*Continued from page 128*)

ENGINEERING FOR DAMS, Vol. I, II, & III—By William P. Creager, Joel D. Justin and Julian Hinds. 929 pp. Published by John Wiley & Sons, New York, and Chapman & Hall, London. $15 the set: Vol. I, $4.50; Vol. II, $6; Vol. III, $6.

TABELLEN ZUR BERECHNUNG VON EISENBETONKONSTRUKTIONEN—Second Edition. By M. Ritter. 90 pp. A. G. Gebr. Leemann & Co. Zurich 2, Switzerland. Price 13 francs. Fr. 13.

EXPERIMENTAL STRESS ANALYSIS, Proceeding of the Society for Experimental Stress Analysis—Vol. I, No. I and No. II; Vol. II, No. I. Published by Addison-Wesley Press, Cambridge 42, Mass. Vol. I, No. I, $3.; Vol. I, No. II, $4; Vol. II, No. I $5.

Reports and Pamphlets

THE LISTING of Recommended Practice for the Design of Concrete Mixes—A.C.I. Mix Design Standard 613—in our issue of Jan. 11 did not give the price, which is 50c. from the American Concrete Institute, New Center Bldg., Detroit 2, Mich.

RECREATIONAL RESOURCES OF THE DENISON DAM AND RESERVOIR PROJECT, Texas and Oklahoma—U. S. Dept. of the Interior. For sale by the Superintendent of Documents, Washington 25, D. C. 45c.

SEABEE ROADS TO VICTORY—By William Bradford Huie. E. P. Dutton & Co., Inc. New York. $1.50.

SURFACE WATER RESOURCES OF IOWA for the period Oct. 1, 1940 to Sept. 30, 1942—Water Supply Bulletin No. 2. Iowa Geological Survey, Iowa City, Iowa.

REVISED RECOMMENDATIONS FOR TAR SURFACE DRESSINGS—Department of Scientific and Industrial Research, Road Research Laboratory. His Majesty's Stationary Office, London. 6d. net.

STUDIES OF THE EFFECTS OF LONG WORKING HOURS, Part 1 and 2—By Max D. Kossoris. For sale by the Superintendent of Documents, Washington 25, D. C. 10c. each.

PUBLICATIONS OF THE GEOLOGICAL SURVEY up to October, 1944 (Not including Topographic Maps)—U. S. Geological Survey, Department of the Interior, Washington, D. C.

MAN AND THE SOIL—By Karl B. Mickey. 110 pp. International Harvesting Co., Chicago 1.

VAPOR TRANSMISSION ANALYSIS OF STRUCTURAL INSULATING BOARD, Bulletin No. 22—By Frank B. Rowley and C. E. Lund. University of Minnesota, Institute of Technology, Minneapolis, Minn.

THE ENGINEERING SIGNIFICANCE OF SOIL PATTERNS—By Donald J. Belcher. Engineering Experiment Station, Purdue University, Lafayette, Ind.

PUMPING OF RIGID PAVEMENTS IN INDIANA—By K. B. Woods and T. E. Shelbourne. Engineering Experiment Station, Purdue University, Lafayette, Ind.

STANCE OF COMMON HARDWOODS TO COMPRESSION PERPENDICULAR TO THE RAIN—By E. George Stern. Bulletin of e Virginia Polytechnic Institute, Blacksburg, Va., Engineering Experiment Station Series No. 57.

PORT ON AMENDMENTS OF THE ZONING ESOLUTION OF THE CITY OF NEW YORK FFECTING HEIGHT AND AREA—City lanning Commission, Municipal Bldg. ew York 7, N. Y.

NTING STEEL—By Wilbur C. Porter. uilding Materials and Structures Report BMS102. U. S. Dept. of Commerce. National Bureau of Standards. Superintendent of Documents, Washington 25, D. C. 10c.

COMMENDED PRACTICE FOR TREATMENT OF CY PAVEMENTS—Wartime Road Problems No. 9. Highway Research Board, Washington 25, D. C.

LOSSARY OF FOREIGN WELDING TERMS—American Welding Society, 33 W. 39th St., New York 18, N. Y.

TERRELATION OF AGENCIES AFFECTING DEVELOPMENT PROJECTS IN NEW YORK—The Committee on Civil Design and Development, New York Chapter of the American Institute of Architects; 115 E. 40th St., New York, N. Y.

RMINATION FINANCING FOR WAR CONTRACTORS—Office of Contract Settlement. For sale by the Superintendent of Documents, Washington, D. C. 10c.

ONCORD, N. H.—71st and 72nd Annual Reports of the Board of Water Commissioners, 1942 and 1943.

ASADENA, CALIF.—Thirty-first Annual Report of Pasadena Water Department, 1943-44.

PRINGFIELD, MASS.—Seventieth Annual Report of the Water Commissioners, 1943.

GARY, IND.—Third Annual Report Sewage Treatment Works for 1943, Gary Sanitary District.

GRAND RAPIDS, MICH.—Annual Report on Operation of the City of Grand Rapids Sewage Treatment Plant for the year 1943-1944.

LARGE-SCALE MODEL STUDIES OF HIGHWAY SUBDRAINAGE—By Bram McClelland. Engineering Experiment Station, Purdue University, Lafayette, Ind.

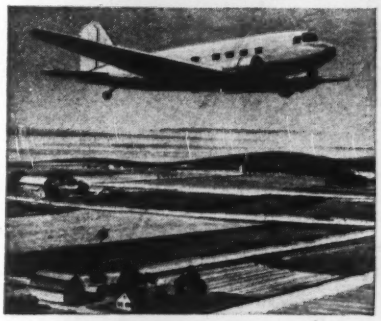
HOW MANY JOBS FOR CALIFORNIANS?—Published by the California State Reconstruction and Reemployment Commission in Jan. 1945.

THE FIRST STEP AND . . . THE UNFINISHED TASK—Postwar Planning in San Bernardino County, California—the State Reconstruction and Reemployment Commission, Sacramento, Calif.

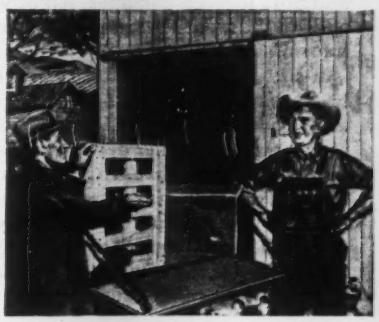
PROBLEMS OF MOBILIZATION AND RECONVERSION—First report to the President, the Senate and the House of Representatives by the Director of War Mobilization and Reconversion, Jan. 1, 1945. Washington, D. C.

Gets Pump by Air Express: Dealer Saves Money, Cows get Water

WATER PUMP on Wisconsin dairy farm breaks down. The owner gives his local dealer a hurry-up call. Dealer promises quick delivery even though pump must come from Cleveland. (He has it in the morning by specifying Air Express.)



DEALER ABSORBS Air Express charges but, even so, he figures a saving of money — because the pump is a high-priced, slow-turn unit that he cannot afford to stock. (With Air Express the nation's inventory is within hours of your business.)



THOUSANDS of businessmen find this fastest delivery a real economy — *a real money-maker* — when a customer wants something not in stock. (Yes, with Air Express, you give high-speed service on high-priced items without cost of stocking.)

Specify Air Express — Low Cost for High Speed

25 lbs., for instance, travels more than 500 miles for $4.38, more than 1,000 miles for $8.75, more than 2,000 miles for $17.50, at a speed of three miles a minute — with cost including special pick-up and delivery in all U. S. cities and principal towns. Same-day delivery between many airport towns and cities. Direct service to scores of foreign countries. Rapid air-rail service to 23,000 off-airline points in the United States.

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Phone RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION
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Definite circulation of oil over a predetermined circuit inside the housing is one of the features of the latest Fuller Transmission, the 5A920. Baffles and the housing walls direct movement of the oil, which is "pumped" by certain pairs of gears. Included in the circuit is a sediment chamber designed to collect and hold foreign particles. All of which adds to the wear-life of every part of the transmission.

It's a sure thing that lubrication will become an increasingly important matter as heavy duty transmissions are subject to greater and greater demands. Today's Fuller 5A920 represents a practical answer; the Fuller Transmission of Tomorrow will benefit from today's experience. That is one more reason why you should check with Fuller when you start making plans for the future.

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Powerful, fast-stepping Mobile Crane . . . one-man operated . . . for "on and off" highway operations . . . simple to operate . . . (eliminates cut-up terrain, mutilated concrete docks and runways.)
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Men and Jobs

Jack W. Dixon, for the last 18 months a member of the facilities committee of the War Production Board, Washington, D. C., is now engineering assistant to the commissioner of the Bureau of Reclamation. Mr. Dixon, who obtained his engineering education at the University of Iowa and other schools, has had a wide engineering experience.

His early work was in the St. Louis, Mo., and Rock Island, Ill., districts of the Corps of Engineers, where he first worked in 1926 as surveyman. By November, 1929, he had advanced to the position of chief of the hydraulic section at Rock Island, a position held until 1940. In this latter work he supervised the hydraulic design, hydraulic features of construction and hydraulic system operation of 12 upper Mississippi River dams costing $100,000,000 to build. His office was also responsible for the field surveys, engineering and economic studies, and preparation of more than 20 flood control, navigation, and multiple purpose river basin reports for the district engineer and ultimate approval and transmittal from the Chief of Engineers to the Congress.

In July, 1940, Mr. Dixon joined the National Resources Planning Board to serve in varied capacities, including chief of the project review section, chief of water resources section, and secretary of the water resources and project review committees. In July, 1943, he left the planning board to joint WPB's facilities committee, which has been responsible for establishment of policies and standards for determination of war-time essentially for construction projects. It is said that, subject to the approval of the Secretary of the Interior. Mr. Dixon may soon become one of the assistant directors of the Bureau's branch of project planning.

Col. Roy D. Burdick, Corps of Engineers, has been appointed Army district engineer at Little Rock, Ark. Col. Burdick as chief of the engineering and planning division of the Memphis district, directed the fight to prevent inundation of Cairo, Ill., in the 1937 flood. When he was ordered to Little Rock, Col. Burdick was serving as deputy division engineer of the

KOPPERS

and Construction

PROPER HIGHWAY MAINTENANCE CONSERVES MANPOWER

—Tearing up and rebuilding roads that have had insufficient maintenance is a serious drain on war-vital manpower. Surface treatments and other economical maintenance with Koppers Tarmac will help keep roads in service. Pressure-treating of wood guard rails, highway posts, etc., prevents decay and replacement.

PROPER WATERPROOFING PRESERVES CONCRETE

—On this concrete underpass, open-mesh cotton fabric, thoroughly saturated with coal tar pitch, is being laid in successive moppings of coal tar pitch to protect concrete which is to be underground and exposed to water. Koppers will be glad to send you a folder on the use of Koppers Coal Tar Pitch Waterproofing for concrete and masonry.

PROPER PRESSURE TREATMENT PRESERVES WOOD

—Pre-fabricated, pressure-creosoted wood bridges are strong, durable, easy to assemble and erect, and economical. Recent survey showed 9 pressure-creosoted highway bridges cost $70,900; they would have cost $212,000 if built of other permanent materials.

BUY WAR BONDS . . . AND KEEP THEM!

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WEATHERPROOF
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Come rain or shine, a Weatherproof Van Dyke never lets you down. Strong, easy-to-point, insoluble lead insures greater Pigment-to-Paper Writeability...gliding smoothness ...better legibility. Choose from 24 brilliant, all-weather colors. Ideal for charts, drawings—or whenever you need totally *moisture-proof color markings.*

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IN FINE WRITING MATERIALS SINCE 1849

Upper Mississippi Valley at St. Louis. He left Memphis in 1938 for a 2-year assignment at the University of West Virginia. Later he served with the Third Air Force, at Miami, Fla., and subsequently at Ogden, Utah.

Joseph Franta, formerly of New Ulm, Minn., has been named city engineer at Bemidji, where he was an engineer at the local airport project.

Lt. Col. E. E. Taylor directing all Army construction activities at Minneapolis and St. Paul, Minn., has become head of the recently-expanded building operations at the Gopher Ordnance Works at Rosemount. **Maj. Homer D. Thomas,** formerly in charge of construction at the Iowa Ordnance plant, Burlington, will take over the twin cities construction projects office.

Matt S. Madden has been named chief deputy highway engineer for Jackson County, Mo., at Independence. He served for many years as chief of surveys and plans for the department.

Pfc. Joseph P. Belick, formerly the operator of two stone quarries, two cinder concrete products plants, a building materials yard and an excavating business at Easton, Pa., is now stationed at a B-29 superfortress bomber base in India.

F. Stuart Fitzpatrick, manager of the construction and civic development department of the United States Chamber of Commerce, has been elected chairman of the advisory committee on government questionnaires. He succeeds W. J. Donald, managing director of the National Electrical Manufacturers Association, who, as first chairman, served for nearly two years. The committee, consisting of 14 industry men, counsels the Federal Budget Bureau on the simplification or elimination of federal reports and questionnaires.

J. W. Sanger has been named manager of the Winnipeg, Man., Hydro-Electric Commission, succeeding the original manager J. G. Glarsco, who has retired after 35 years service.

J. W. Knox has been appointed safety engineer in the Kentucky Highway Department, succeeding T. B. Smith.

J. L. Burkholder, former assistant general manager of the Metropolitan Water District in southern California, recently became manager-engineer for the San Diego County Water Authority to guide analysis on selection of a permanent route for importing 50,000,000 gal. of Colorado River water daily. Mr. Burkholder recently resigned as chief construction engineer of Horseshoe Dam in Arizona.

L. C. Ayres, of Roanoke, Va., railroad builder has retired as assistant general manager of the Norfolk & Western Railway after 54 years of service.

Capt. Roderick G. McCalley, injured during service with the U. S. Engineer Corps during the North African campaign and hospitalized for 17 months, has reported for duty with the Portland, Ore., district of the U. S. Engineers Corp.

John W. Alden, recently county engineer of New Castle County, Del., is now associated with the street and sewer department of Wilmington, as assistant to Harry L. Maier, chief engineer. Mr. Alden will be in charge of sewer work, and will devote most of his time for the present to post-war work on interceptor sewers and sewage treatment.

Edward B. Baur has been named acting chief division engineer in Toledo, Ohio., for the Ohio State Highway Department, replaced **Earl Reeb,** who is now Defiance County engineer. Mr. Baur formerly was first assistant division enginer.

John W. Dowler has become Athens County, Ohio, engineer.

Barclay J. Sickler former chief of the power division of the Office of War Utilities, Washington, D. C., has rejoined the staff of the Bonneville Power Administration at Portland, Ore. Sickler was loaned to WPB two years ago with the understanding he would return to Bonneville as soon as OWU could release him. He returns to his former position as chief of the division of power and sales service.

Jean Asselin, former manager of the City of Three Rivers, Que., and **Claude Robillard,** former deputy transit controller for the dominion government, have been named engineers in the Department of Public Works, Montreal.

The new Washington state highway director is **Clarence Hickey,** who has been Snohomish County engineer at Everett, for the last 16 years. During the preceding 10 years he was chief deputy in the state engineer's office. Previously he was assistant city engineer at Bremerton, Wash., for six months during the first World War; engineer in Victoria, B. C., and supervisor of construction of the original Sultan River pipeline supplying Everett with water.

WHEN THE INDUSTRIAL GIANT RETURNS TO CIVILIAN PRODUCTION

GAR WOOD

Specialized Equipment

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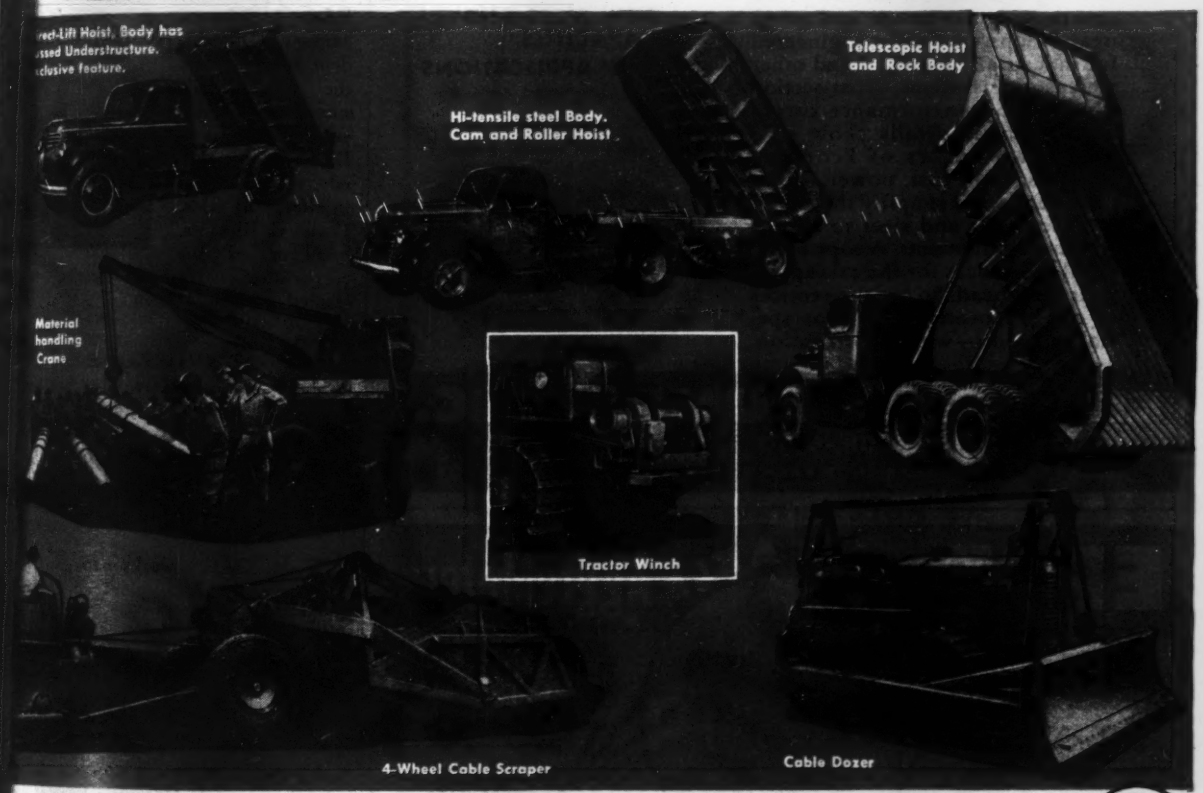
Gar Wood equipment is "slugging it out" with the enemy on all fronts . . . performing a hundred and one specialized jobs that are a part of modern industrial warfare. Gar Wood engineers are experts in designing equipment for rugged, dependable service.

It is our purpose to produce the best possible equipment of war in whatever quantities are needed by our fighting men. When Victory has been won, Gar Wood equipment will again be available for civilian use.

BUY U. S. WAR BONDS TO ASSURE EARLY VICTORY



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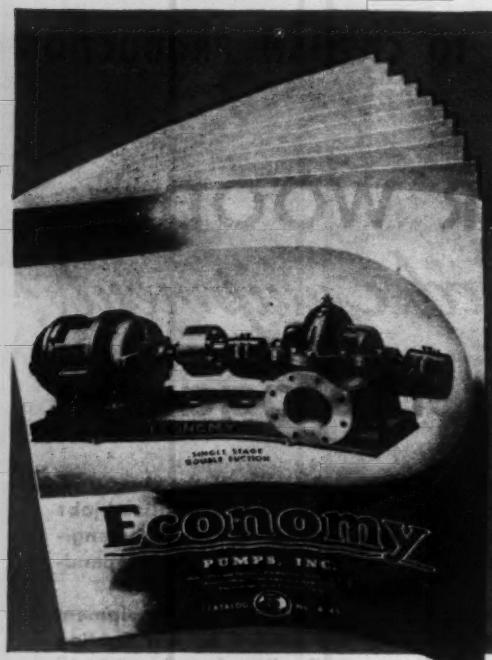

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Now Ready!

Catalog A-145, just off the press, covers an entire range of Centrifugal Pumps especially engineered for industrial, municipal and other water supply systems. Cross-section illustrations, performance curves and structural details show at a glance why users of Economy Pumps save in cost, power, labor. Selection tables simplify the choice of exact types and sizes to handle specific requirements. A copy of the Catalog is yours for the asking, on your letterhead. So are the services of our engineering staff—for special problems—without obligation.

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Manufacturers' Activities

THE BOARD OF DIRECTORS of Worthington Pump and Machinery Corp. has elected Clarence E. Searle president to succeed Harry C. Beaver, elected vice-chairman of the board and chairman of the management committee.

Mr. Beaver has been president of Corporation since 1931, and Mr. Searle has been vice-president in charge of sales since Joining the Worthington organization in 1932, following a long period of service in various executive capacities with the Allis-Chalmers Manufacturing Co. of Milwaukee, Wis.

Hobart C. Ramsey, vice-president in charge of operations, was elected executive vice-president.

Edwin J. Schwanhausser, vice-president in charge of the corporation's manufacturing and sales operations in Buffalo, was elected vice-president in charge of sales. Leslie C. Ricketts, manager of the corporation's Harrison works, was elected a vice-president.

THE G. W. VAN KEPPEL CO., 2440 Pennway, Kansas City, Mo., has been appointed distributor for The Euclid Road Machinery Co. in that territory. In addition to Euclid equipment, the company distributes a well-rounded line of other construction machinery.

W. M. KELLEY, works manager at the Youngstown, Ohio, plant of Truscon Steel Co., Republic Steel subsidiary, has been made assistant to the vice president in charge of operations at Cleveland. He will have charge of Republic's manufacturing divisions.

LUKE H. SPERRY is now director of engineering for Hercules Powder Co. and Ernest S. Wilson is chief engineer. Mr. Sperry has been associated with Hercules for 26 years and chief engineer since 1939. In 1941, he became a director. He and Mr. Wilson have

ayed an important role in directing construction and beginning of operations of six large Hercules-operated dnance plants.

Mr. Wilson, a graduate of the University of Delaware, joined Hercules 1923 after working for the Delaware ate Highway Department and the ilmington Marine Terminal.

ANNOUNCEMENT has been made of the ppointment of Chas. W. Springer as nager of eastn sales by the aver Tank & g. Co., Inc., of t Chicago, Ind. Springer, forerly sales manr, barrel divin, Jones and ughlin Steel Co. nd familiar to any as a repreintative of the Chicago Bridge and Iron o., brings to the Graver organization well rounded background of executive les direction in the steel plate and llied fields. He will direct all of Grar's east coast sales activities from the mpany's offices at 424 Madison Ave., New York City.

THE NAME of the Dresser Manufacring Co. has been changed to Dresser dustries, Inc. The company, large anufacturer of equipment for the oil, s and industrial fields, is moving its adquarters from Bradford, Pa., to the erminal Tower, Cleveland, Ohio.

W. E. COOK, president of the Ottmwa, Ia., Mill & Construction Co., has etired after having been with the comany for 38 years. His interest in the illwork firm has been purchased by yle P. Howard, who becomse president. ther officers are Robert Peterson, vicepresident, and Frank Billhymer, secreary-treasurer.

TUBE TURNS, INC., Louisville, Ky., as announced the appointment of Ches Herndon as manager of the company's ouston, Tex., branch with offices in e Commerce Building. A native of St. ouis, Herndon's association with suply firms in the southwest dates from 926. He was with Hanlon Waters, Inc., Tulsa, Okla., for 13 years.

W. C. SCHUMACHER, manager of sales, otor truck division, International arvester Co., has announced the apointment of Karl W. Freeman as Southrn district manager. Mr. Freeman has een the branch manager at Atlanta, a. His service with Harvester began t Des Moines, Ia., in 1925. Later he erved at the Council Bluffs, Amarillo, nd San Antonio branches.

MAN has long talked about a "better" mousetrap. Just what would a "better" mousetrap be? A "better" mousetrap is one which would catch more mice more surely, over a long period of time without costing too-much-per-mouse caught.

A better sewer, or any other kind of drain, is one which will do the job best, over the longest period of time at the lowest cost. Low *first* cost doesn't mean a thing, if the sewer or drain will not stand up in long service.

Vitrified Clay Pipe is the finest material available for carrying any kind of sewage or drain water. It is both CHEMICAL-PROOF and ABRASION-PROOF. It is economical, strong and easy to install.

Vitrified Clay Pipe Will Not CORRODE, DECOMPOSE OR CRUMBLE through the action of acids, alkalies, industrial wastes, gases or the grinding abrasion of sand and gravel moving in water.

Engineers and builders who must consider the sewerage or drainage problems in the construction of highways, streets, airports, railroads, public buildings, factories and homes cannot find a better "underground" material where long life and long-run economy are concerned.

When *final* cost, as well as first cost, is fully considered, you will find: "IT WILL PAY TO USE CLAY."

WRITE FOR INFORMATION

Through its technical engineering staffs, the Clay Pipe Industry carries on constant research to improve products and to adapt them to current construction practices. For latest information or engineering literature, write to:

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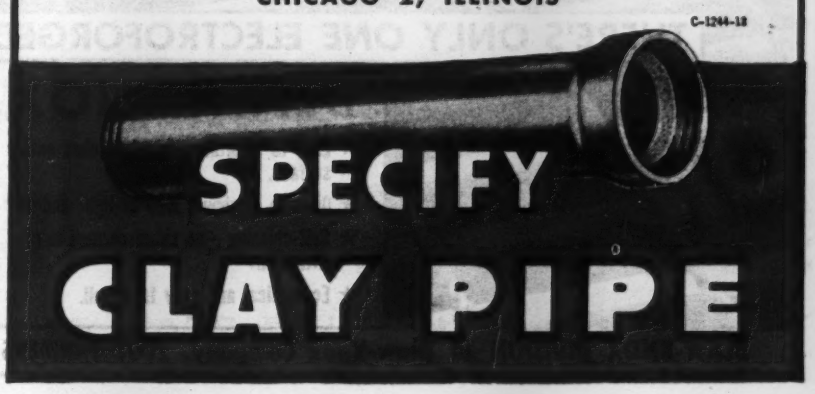

New Aids to the Constructor

Heat Lamp

Infrared heat lamps have many applications in the civil engineering field. They are used for drying and for heating to a predetermined temperature for testing materials. They are used for drying blueprints and vandykes—for the latter application they are said to be especially valuable as they do not shrink or distort the reproductions and accurate scale prints can be obtained from them.

Infrared lamps are designed to produce heat instead of light and give off mostly invisible rays, but otherwise are similar to incandescent lights. About 90 percent of the energy they consume is converted to heat.—*Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.*

• • •

Dowel Setter

A dowel setting machine, the Allen doweler, eliminates all accessories in connection with supports for dowels in placing of concrete pavement and reduces by about 80 percent the man-hours required for placing such dowels.

Machines built to date are for 25-ft. wide strips of paving, and are readily adjustable to place dowels ranging in length from 14 to 24 in. and in size from ¾ in. to 1 in.

The machine will place dowels to any desired pattern with almost perfect uniformity, very important since the dowels are primarily placed in the slab for the purpose of reinforcing across a planned plane of weakness and, after the crack has formed, to allow the dowel to function properly for expansion and contraction. The photo shows the frame carrying the reinforcing lowered to the pavement surface and ready to push the

DENTISTRY FOR DIPPER TEETH

P&H Electrodes help you cut maintenance costs . . . avoid costly delays and equipment lay ups . . . keep machinery working longer. Build up and hard-surface worn parts—repair-weld broken ones . . . right on the job with P&H Welding Electrodes . . . to save money and time.

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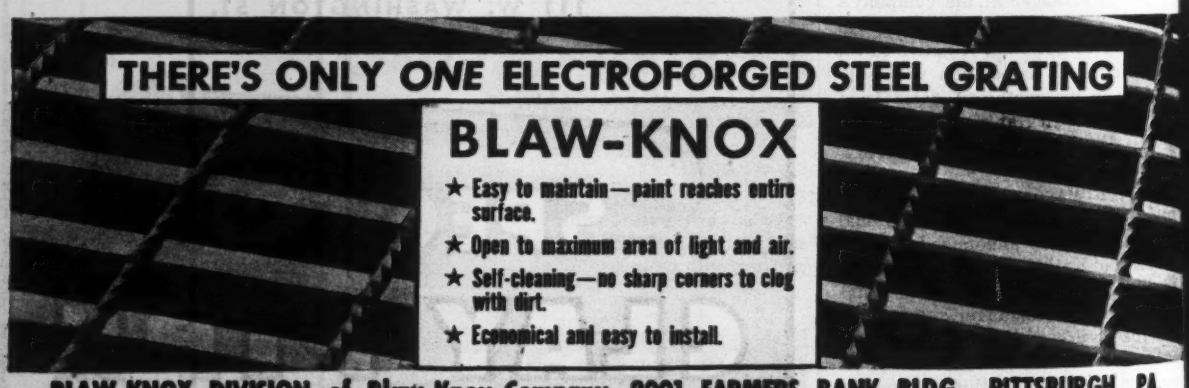
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★ Self-cleaning—no sharp corners to clog with dirt.
★ Economical and easy to install.

BLAW-KNOX DIVISION of Blaw-Knox Company, 2001 FARMERS BANK BLDG., PITTSBURGH, PA.

These are the things that make America strong... the industries that RB&W has served during its 100 years of developing better fasteners for better products.

NO. 3 *Railroads*

The Railroads.....

CHOO CHOO TO SWWISSH!

You hardly *see* one of today's streamlined fliers before—*swwissh*—it's practically out of sight! What a contrast—in speed, comfort and appearance—to laboring, hard-chugging trains of 100 years ago... trains which were also the miracles of their times... There is *still* one important element of construction that the pioneer trains and the latest models have in common—the use of RB&W bolts and nuts. Around the middle of the last century, RB&W EMPIRE provided the quality that railroading in those days required... and, as the railroads' requirements became more severe through the years, RB&W quality was ready to meet those new requirements.

From the invention of the first automatic cold-header nearly a century ago, development work, equipment and RB&W has invested many fortunes in research and plants. And from these investments has come the creation of a host of new processes and methods for producing fasteners of even greater strength and accuracy—of better appearance and finish—of maximum dependability... Entering its second century, RB&W has great plans for further developments that will be important news to the transportation industries and others that have always looked to RB&W for the quality that makes *their* quality products easier to assemble and stronger and better in service.

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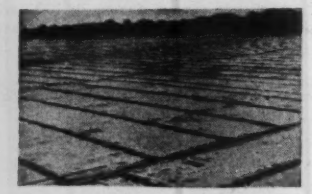
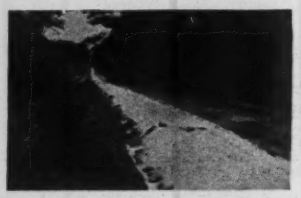
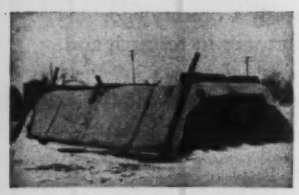


PROTECTING SOIL CEMENT



PROTECTING ROAD MIX



PROTECTS MATERIALS STORED IN THE OPEN

UNMATCHED in their ability to hold moisture within the slab, SISALKRAFT Road Blankets have a time-proven record as the Number One concrete curing agent — producing denser, longer lasting concrete roads at low cost.

Savings in time, manpower and money are effected by the speed with which two men apply SISALKRAFT Blankets over the slab. No sprinkling — no burlap — just "let 'em lay." The concrete cures automatically! The slab is protected from weather and dirt! The blankets are used again and again.

Protect soil cement, road mix, materials and equipment with SISALKRAFT. It's tough, weatherproof, scuffproof, tear-resistant!

As vital war needs decrease, more and more SISALKRAFT will be available for your use. Victory comes first — and that's the way you want it, we're sure.

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bars down to the desired depths.—*M. H. Golden Construction Co., 3485 Noell St., San Diego 1, Calif.*

• • •

Shallow and Deep Well Pump

Designed so that one pump may be used for either shallow or deep well service, the new dual purpose Ejecto type water system is said to be very easy to assemble and service. Connections for each type are packaged separately; either will fit the same pump. No special tools are required, and the need for periodic packing has been eliminated. —*The F. E. Myers & Bro. Co., Ashland, Ohio.*

• • •

Waterproof Material

A comparatively slow drying material, No. 2701 Dolfinite Black Waterproofing, is flexible and, it is said, will neither become brittle and crack in cold temperature, nor ooze or soften in temperatures up to 125 deg. F.

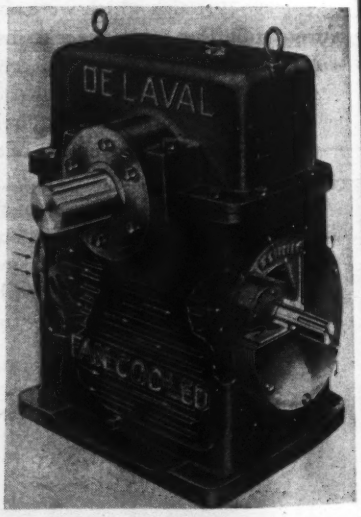
This acid- and alkali-proof material for waterproofing damp walls, foundations, tunnels and underground iron pipes, is said to have good brushing qualities.—*Dolphin Paint & Varnish Co., 921 Champlain St., Toledo 3, Ohio.*

• • •

Worm Gear Speed Reducer

Forced air-cooling used in the new DeLaval fan-cooled worm gear removes heat so effectively that gear capacity is doubled for practically all ratios and sizes at 1,750 rpm.

A fan mounted on the worm shaft draws air at high velocity over and around heat dissipating ribs upon the air side of the oil reservoir housing the gearing. The use of a double wall in-



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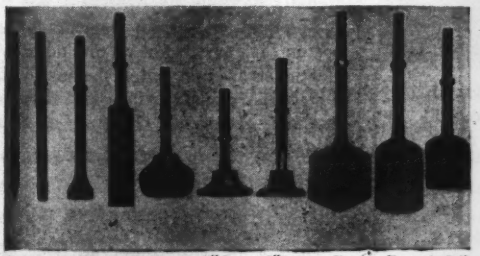
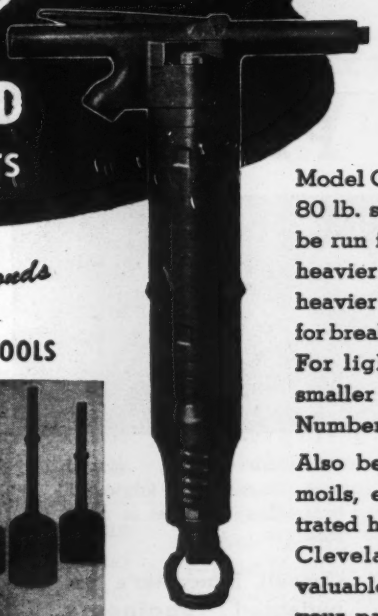


Moil Narrow Chisel | Wide Chisel | Digging Blade | Sheeting Driver | 7" Tamper Bar | 5" Tamper Bar | Clay Blade | Clay Spade | Asphalt Cutter



C7

With the advent of spring thaws, you will need Cleveland Paving Breakers for emergency calls and hurry-up repair work.

Model C7 is best for the average job. It is an 80 lb. slugger, easy to hold. Two C7's can be run from a Number 85 compressor. For heavier work, try the C9, which is two pounds heavier but uses no more air. It is designed for breaking the hardest, reinforced concrete. For lighter work, trimming, etc., use the smaller C10, three of which operate from a Number 85 compressor.

Also be sure to select the proper chisels, moils, etc., from the "Clevaloy" line illustrated here. Bulletin 128 tells all about these Cleveland tools, and also contains many valuable hints on getting better service from your paving breakers . . . *Write for it!*

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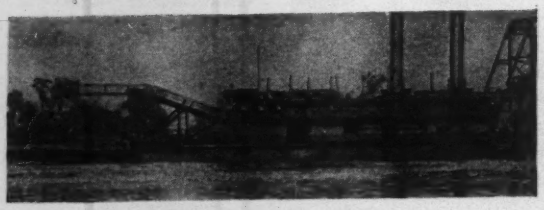

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AVEMENT VIBRATORS

Three types: *Vibrating screed*, full-width, propelled by hand-operated winch and cable or pushed ahead by finishing machine. Gasoline power plant.

Tubular internal, extending entirely across slab, mounted in front of finisher. Gasoline or electric power plant with flexible shaft drive.

Vibrating pan, full-width, carried by two-wheeled trailer behind any standard finisher. Gasoline or electric power plant.

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1, 3, and 4 H.P. gasoline, air-cooled, 4 cycle motors; flexible-shaft drive; interchangeable vibrator heads lubricated for life. Wheelbarrow carriers.

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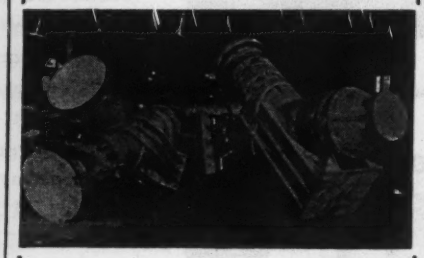
PIPING



Pressure piping, special wyes, tees, etc., fabricated from Class "A" steel or alloy steel.

Consult Lancaster's experienced engineers when you have a problem in fabricated steel plate work. Complete estimates will be submitted without obligation to you. Write, phone or wire today.

LANCASTER IRON WORKS, INC.
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creases the effectiveness of the cooling by confining the cooling air to the housing, thus securing the close air-to-metal contact necessary for maximum heat transfer.—*De Laval Steam Turbine Co., Trenton 2, N. J.*

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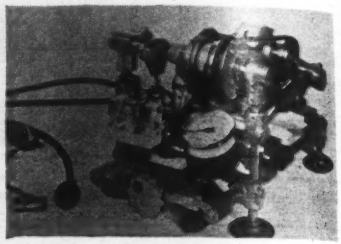
Tachometer

Said to be to a chemical feeder what a speedometer is to an auto, a new tachometer is used in conjunction with vari-



able speed control on reagent pumps to give proportional feeding in ratio to a variable flow through the meter.

Tachometer readings readily convert into gallons per hour fed against various pressures; to divide 300 constant length strokes per minute into many divisions is said to be easy and accurate with tachometer control. At a slight extra cost the tachometer dial is furnished with direct readings of gallons-per-hour-feed, provided injection pressure is specified in advance.—*Chem-Feeds, Inc., 77 Reservoir Ave., Providence, R. I.*

• • •

Industrial Spat

Ankle and foot protection against acids, grease, etc., is provided by a new spat, made from a coated fabric that is lighter in weight than rubber, and extremely flexible.

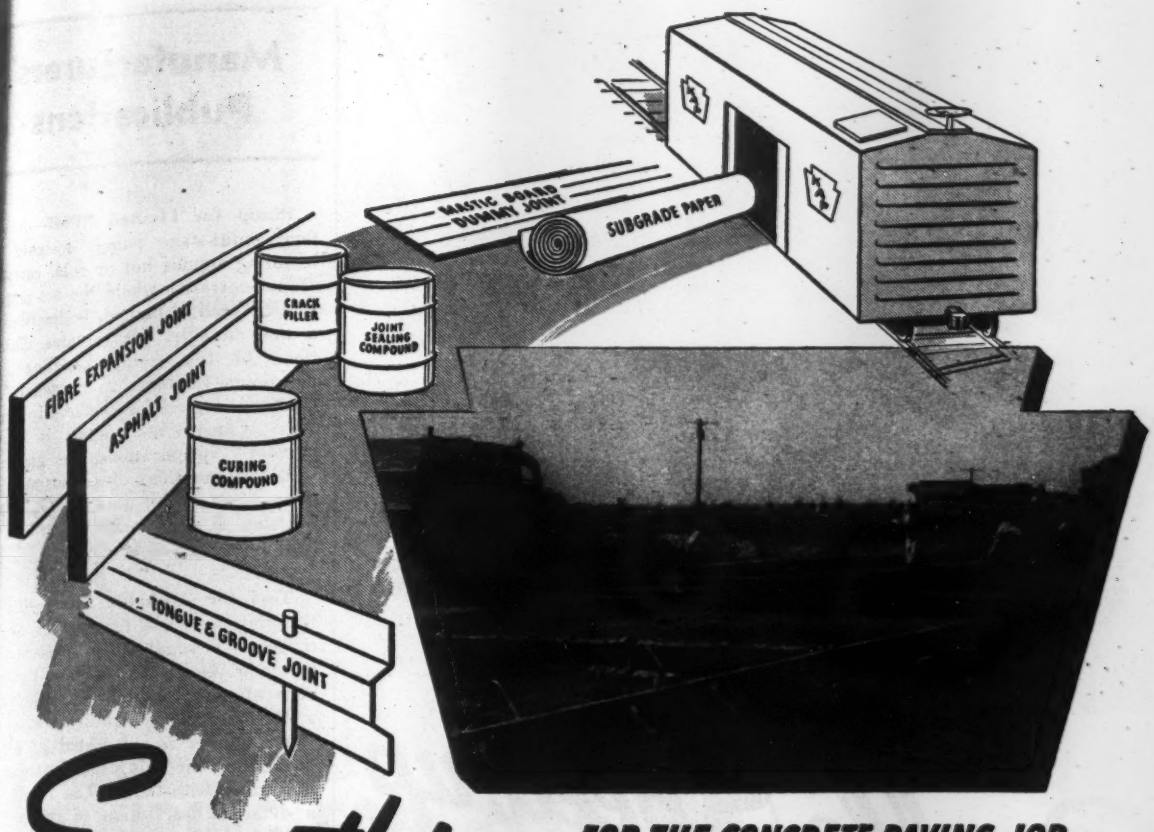
The spat, with snap fasteners top and bottom, is easy to put on and adjust. An elastic strap fits under the instep, and a large flare assures over-all instep protection.—*American Optical Co., Southbridge, Mass.*

• • •

Rust Preventive

Drying in well under an hour, it is claimed, Kendall rust preventive No. 5 has excellent water-repellent characteristics. This substance also withstands seashore exposure tests as well as ultra violet light, humidity and salt spray laboratory tests with temperatures as low as 20 deg. below zero.

This preventive may be applied by brush, spray or dipping; it is also easy to remove with any petroleum solvent or kerosene.—*Kendall Refining Co., Bradford, Pa.*



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YOU'LL save time, money, bookwork and a lot of "headaches" if you let Keystone supply everything you need for your concrete paving jobs. Keystone's line—complete except for the sand, gravel and cement—makes it possible for you to obtain all your requirements from one source. That means no costly delays caused by failure of some vital material to arrive, easier handling, lower freight costs and better all-around service. Keystone Paving Products meet Federal and State specifications, have been proved on the job thruout the country, and represent the latest practical thinking of leading highway engineers.

Keystone Tongue and Groove Joint—used transversally and longitudinally gives maximum load efficiency. Distributes the load without cracking.

Keystone Asphalt Mastic Board Dummy Joints—for true, straight alignment without expensive installing machinery. Waterproof, rigid, easy to handle, low in cost.

Kapco Curing Compound—easy to apply, membrane type, transparent liquid that retains maximum amount of mixing water. Adheres to wet surface, does not crack or shrink.

Other "Road Tested" Keystone Products—Joint Sealing Compound, Crack Fillers, Subgrade Papers, Sewer Pipe Joint Compounds, Fibre and Asphalt Expansion Joint, Waterproofings.

Send for illustrated catalog, price list and details of Keystone's Complete Service.

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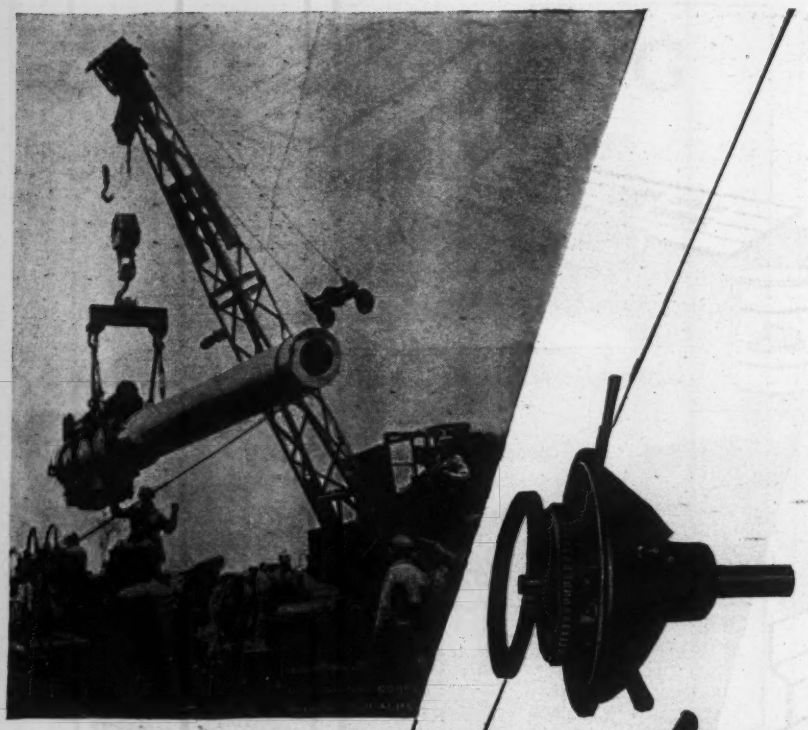


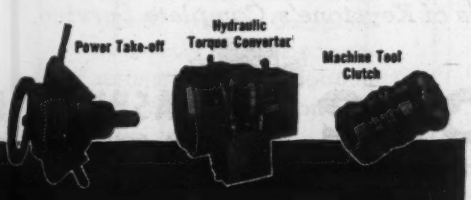
Double Speed-up

Twin Disc Power Take-offs—clutch power take-off units complete with shafts and bearings mounted in rigid cast iron housings—fit standard S.A.E. housing sizes from S.A.E. 6 to No. 00. Rigidly maintained tolerances at every point in production eliminate any necessity of fitting parts during assembly . . . a definite time-saving. This not only speeds up the assembly line but is a distinct advantage when post-sale service becomes necessary. Thus, when you specify Twin Disc *Standard* Power Take-offs, you not only speed up your assembly, but you take full advantage of the *standard* parts stocks maintained by the Twin Disc Clutch Company in 37 industrial centers in the United States and Canada to speed up field service . . . prevent work interruptions or delays in transportation of vitally needed replacement parts. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

Photo above was taken on Italian front; shows Thew Moto-Crane equipped with Twin Disc Power Take-off lowering a 240 mm. howitzer into position.

ARMY-NAVY "E"

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Manufacturers' Publications

Pump for Limited NPSH—A vertical multi-stage pump, designed for handling liquids hot or cold, corrosive or non-corrosive where the net positive suction head is limited, is described in a new bulletin. It contains illustrations of this pump handling light petroleum fractions, in condensate return service and for heater drip pumping. Construction detail is shown, standard specifications are given, as well as dimensions of various standard sizes.—*The Byron Jackson Co., Pump Division, P. O. Box 2017 Terminal Annex, Los Angeles 54, Calif.*

Test for Asphaltic Mixes—An interesting new test for cutback asphaltic mixes is suggested in a recent work by A. W. Dow, Inc., of New York. A conventional stripping test followed by a Hubbard field stability test of the same sample is advocated as closely paralleling the field conditions that the mix must withstand. The results and a detailed description of the test are published in a leaflet.—*Kotal Co., 52 Vanderbilt Avenue, New York 17, N. Y.*

Protective Coatings—A copper naphthenate preservative for the protection of wood against rot, decay, mildew and insects is described in a new folder.—*Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.*

Springs, etc. — Various types of springs, prefabricated piping, pressure vessels and heat exchange equipment are described in new bulletins.—*American Locomotive Co., 30 Church Street, New York 8, N. Y.*

Diaphragm and Plunger Pumps—A complete pump catalog gives information concerning the following types of pumps: self-priming centrifugal, gasoline engine powered, portable; high-pressure; electrically or belt driven; diaphragm and plunger. There is also information on how to select the correct pump.—*Marlow Pumps, Ridgewood, N. J.*

Splicing Electrical Applications—A 6-page folder on a method of banding and splicing electrical applications describes tools used, lists sizes of preformed and open end clamps available in a copper brass alloy for electrical use, and tells how to apply the bands on many electrical jobs such as connecting

POURING CONCRETE UP HILL!

● Smith-Mobile Truck Mixer provides a fast, controlled discharge *even when the machine is on a steep incline.* The patented T-shaped blades scoop up the thoroughly mixed concrete and carry it swiftly to the discharge opening, without segregation. The speed of the drum controls the speed of discharge and a smooth steady flow results, even on an up-grade.

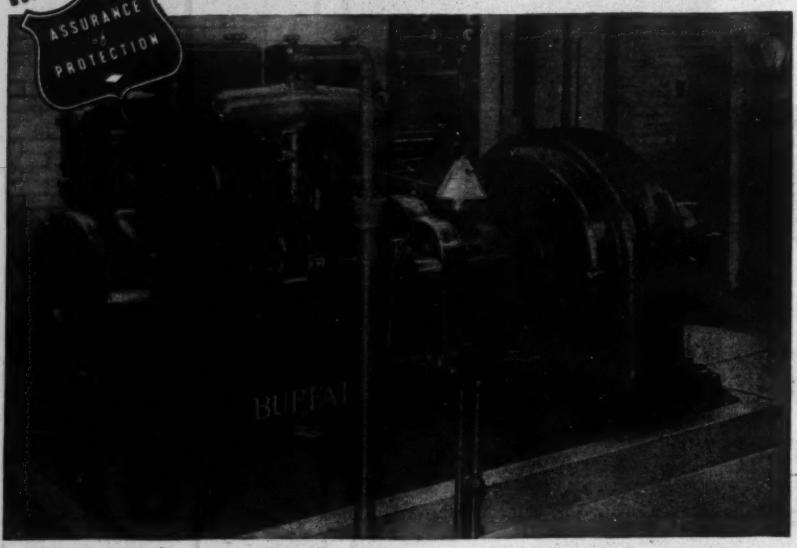
Smith was the FIRST truck mixer manufacturer to introduce a HIGH DISCHARGE model, eliminating the need for a rear-end hoist with its original extra cost, dead load and maintenance expense. And Smith-Mobile pioneered many other time-tested truck mixer features. It will pay you to investigate. Write today for Catalog No. 198-C.

The T. L. SMITH CO., 2855 N. 32nd St., Milwaukee 10, Wis.

The illustration above shows a No. 4 Smith-Mobile, one of a fleet operated by Western Concrete and Equipment Company and used in the construction of a Southern California war plant. This Smith-Mobile is discharging concrete into a high floor hopper. The ramp is a 14° grade and the axis of the mixer drum is 18° from horizontal — yet the speed of discharge is NOT seriously affected by this steep incline.

SMITH-MOBILE

The ORIGINAL HIGH DISCHARGE Truck Mixer and Agitator



BUFFALO Model RA-4 Engine. Direct-connected to a 75 Kva Generator. Sewage Treatment Plant, Norristown, Penna.

WITHOUT STAND-BY EQUIPMENT POWER FAILURE...*Breeds Disaster!*

Rapidly as repairs to power lines and equipment can normally be made, there is always time for disaster to strike during a breakdown. Fire underwriters, who know more about this than anyone, base their rates upon it as a fact; hence in any community, stand-by equipment pays for itself in insurance savings.

For assurance of protection, select BUFFALO Engines for motor generator or pumping sets. Their specifications will convince the engineer that they are completely trustworthy, and a visit to a Buffalo-powered station will prove to the operating man that here is the ideally clean, quiet-running and dependable motor for this service.

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splicing, reinforcing, lining and repairing lines.—*The B. F. Goodrich Co., Akron, Ohio.*

Plywood Applications — Practical booklets are available on construction applications for plywood, but at present some of this manufacturer's products are only for military construction. The booklets give typical joint details and engineering formulae.—*Harbor Plywood Corp., Hoquiam, Wash.*

Anti-Friction Bearing Maintenance—A new 20-page ball and roller bearing manual gives instructions for removing, cleaning and reinstalling in new or used equipment. These instructions, covering the types of bearings in most general use, are designed to assist repairmen in shops and field organizations in the conservation of bearings—*Engineering Committees, Anti-Friction Bearing Mfrs. Assoc., Inc., 60 E. 42nd St., N. Y. 17, N. Y.*

Steel Plate Fabrication—A bulletin on steel fabrication describes and illustrates the equipment and services available for precision shape cutting, stainless steel welding, and plate bending on machinery that develops up to 500,000 lbs. of hydraulic pressure.—*Marine Fabricators Co., Perth Amboy, N. J.*

Mobile Swing Boom Crane—A 24-page booklet, with 74 photographs and diagrams and concise specifications, shows the application of cranes in loading, unloading, transporting materials—from one to ten tons—under the most difficult condition.—*Silent Hoist Winch & Crane Co., 841-877 63rd Street, Brooklyn, N. Y.*

Construction—An unusually handsome book has been issued to tell the story of 75 years of construction work by the Rogers organization.— *Geo. W. Rogers Construction Corp., 6 Church St., New York 6, N. Y.*

The Rud-o-Matic Tagline is operated on a spring principle and maintains at all times a positive tension sufficient to steady a clam shell bucket under any and all conditions, and will operate perfectly with the boom at any angle. It eliminates all the grief usually encountered with the average tagline as there are no weights, tracks, pins, carriages, or sheaves to wear out or to get out of order. Because of the large bearing and fewer sheaves, the saving on cable alone would eventually pay for it.

Tagline is complete with fair lead and cable attached and can be installed in less than one-half hour. Most of the crane manufacturers have adopted the Rud-o-Matic as standard equipment.

McCAFFREY-RUDDOCK TAGLINE CORP.

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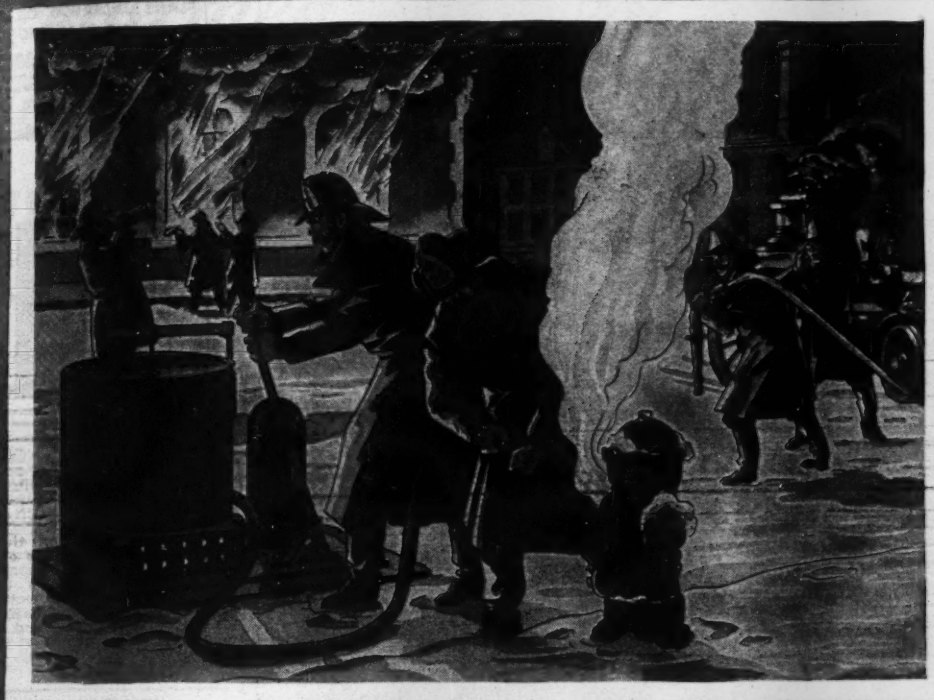
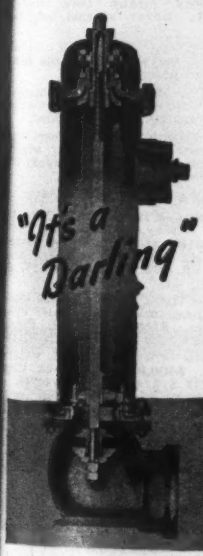


VANISHING AMERICANS

"THE STEAM SHOOTER"

First in a Series of Early American Scenes No Longer Necessary in Communities Served by Darling Hydrants



THERE'S a steam-shooter in every well equipped fire department, but in the community equipped with properly installed Darling hydrants it's about as useful as the old-fashioned bucket brigade.

To protect Darling hydrants against freeze-up, from ten to eighteen ports drain all water from the barrel. When properly installed, these ports are open whenever the main valve is closed. Stoppage or clogging of several ports does not impair the hydrant's drainage efficiency, and when the main valve is open, the drain ports are flushed under pressure to clean out sediment or foreign matter.

This is just one feature of the Darling hydrant which makes it first choice in hundreds of American cities, towns, villages and industrial plants. Darling hydrants are sturdily built, long-lived, easy to maintain. They combine rugged strength with careful machining and expert design.

For full protection through the years, pick Darling.

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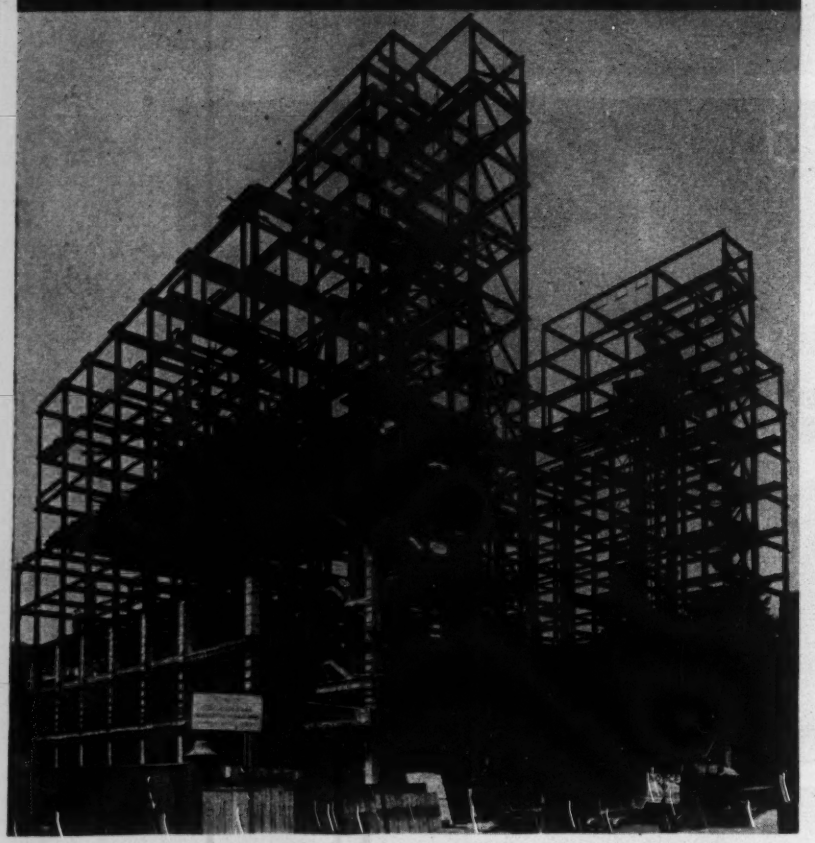
WILLIAMSPORT, PA.

when the time comes, remember . . .



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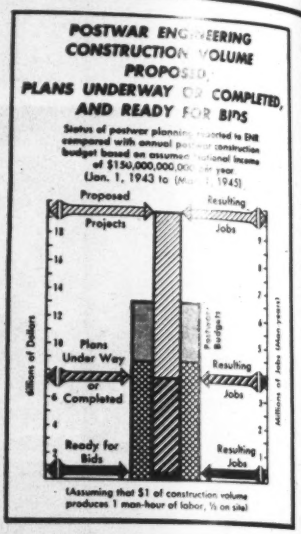
POSTWAR PROJECTS


POSTWAR ENGINEERING CONSTRUCTION VOLUME PROPOSED
PLANS UNDERWAY OR COMPLETED, AND READY FOR BIDS
Proposed Projects
Resulting Jobs
Billions of Dollars
Plans Under Way or Completed
Ready for Bids
Resulting Jobs
Resulting Jobs
(Assuming that $1 of construction volume produces 1 man-hour of labor, ½ on site)

Projects proposed for postwar construction have been published in these columns since January, 1943 as they have been reported to ENGINEERING NEWS RECORD.

Statistics based on these reports are used by the Committee on Postwar Construction of the American Society of Civil Engineers to measure the progress of plans for postwar projects.

The chart above shows, both in estimated dollar volume and in jobs or man-years of labor, how fast this reservoir of future work is filling up.

WATER SUPPLY

PROPOSED WORK

Calif., Hollister—City, City Hall, exten., imprv. water sys. **$50,000.**

★**Calif., San Diego**—City, Civic Center, water treatment plant and regulating reservoir in Alvarado Canyon and pipelines from San Vicente and El Capitan Reservoirs to supply city with water from new connection with Metropolitan Water Dist. Aqueduct, **$6,000,000.** Bond election Apr. 17.

Ill., Joliet—State Dpt. Pub. Safety, Armory Bldg., Springfield, elevated water storage, 300,000 gal. capacity, pumps, etc. **$51,500.**

Ill., Stateville (mail Joliet)—State Dpt. Pub. Safety, Armory Bldg., Springfield, deep well at Honer Farm, **$51,500.**

★**Ill., Urbana**—University of Illinois, Urbana, distr. sys. addns. (distr. stage), Proj. 24, **$764,000;** water station imprvs., Proj. 34, **$120,000.**

Okla., Britton—City, City Hall, addnl. wells, pump. equip., water main extens. **$30,000.** Financing not provided.

Tex., Jasper—City, M. P. Hancock, mayor, City Hall, exten., imprv. water and sewerage sys. **$100,000.** Financing not provided.

Que., Montreal—Municipality, reconstructing McTavish Reservoir and water supply main from Atwater Ave. and Sherbrooke St. to Outremeont Reservoir. **$450,000.**

PLANS UNDER WAY

Calif., Los Angeles—City Bureau of Power & Light, 207 S. Bway., plans 40% completed spillway gates at Drinkwater Reservoir, **$76,800.** S. B. Morris, ch. engr., and R. R. Robertson, ch. electrical engr., 207 S. Bway.

Calif., Modesto—City, City Hall, bond election April 10, imprv. municipal water sys., incl. pipelines, etc. **$100,000.** F. J. Ross, City Hall, city engr. CD 11/15—ENR 11/30.

Calif., Sacramento—City, City Hall, watermains inside city. **$400,000.** F. Klaus, City Hall, city engr. CD 2/3/44—ENR 2/24/44.

★**Ill., Rock Island**—City, City Hall, WW standpipe, other imprvs. **$1,000,000.** W. J. Gallagher, City Hall, city engr.

Ill., Savanna—City, WW Dpt., City Hall, preliminary sketches water treatment plant, watermains, **$100,000.** Beling Engineering Co., 501 15 St., Moline, consult. engr.

Ind., Anderson—City Water Dpt., P. Lalk, supt., exten. lines into many new adds. surrounding city, **$25,000** or more. V. Lee, City Hall, city engr.

Preformed wire rope

SAVES TIME 3 WAYS

Men in every industry are changing to Preformed wire rope because they have discovered it saves time in three important ways.

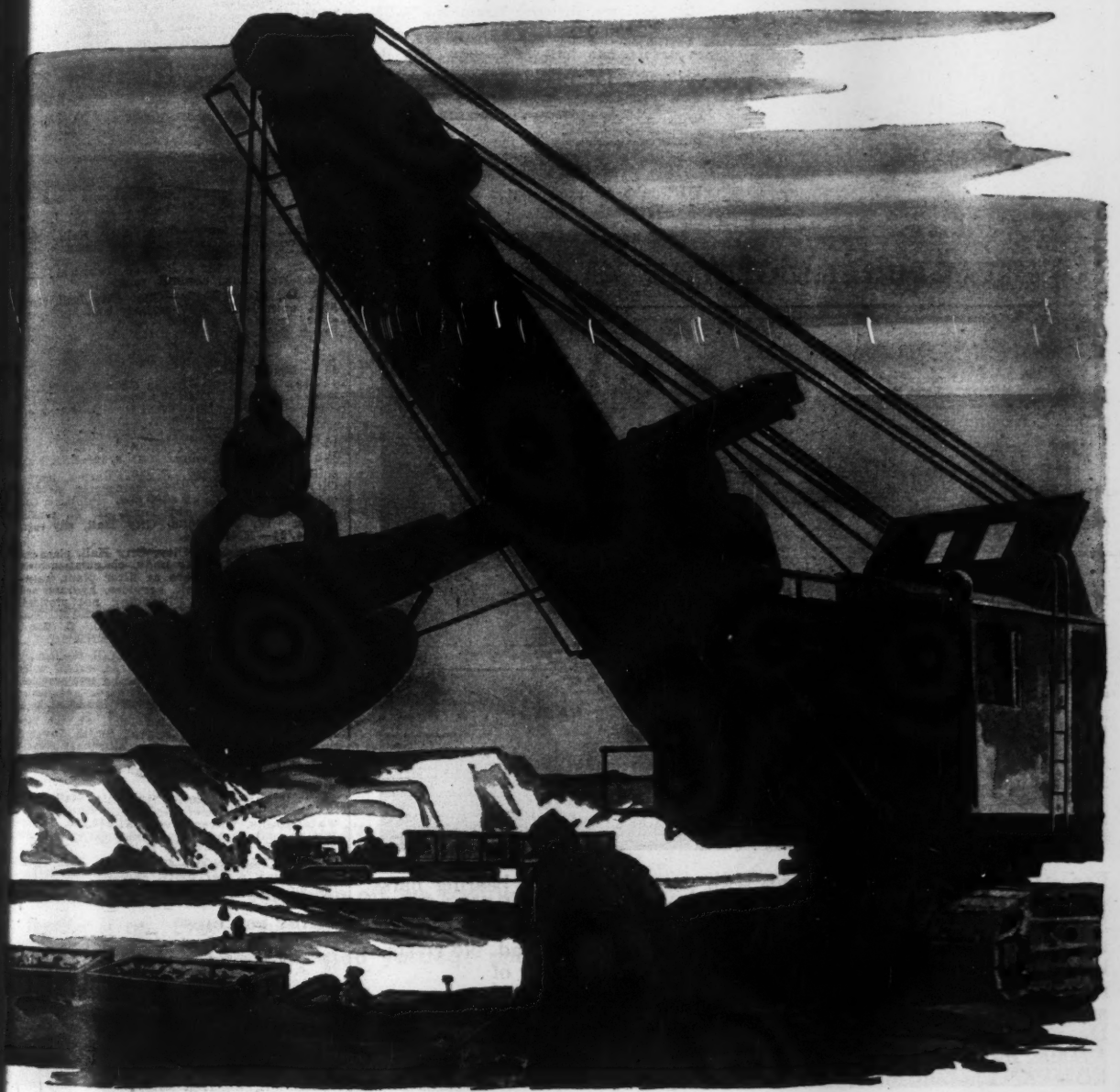
First, it cuts time of installation at least in half because it is so easy to handle, so free from kinking.

Second, Preformed saves time in operations. It is so flexible it can be spooled at higher speeds.

Third, it reduces time-out for shutdowns and replacements because it lasts longer.

These are potent reasons why men searching for new ways to save time prefer Preformed wire rope.

ASK YOUR OWN SUPPLIER FOR PREFORMED WIRE ROPE



CEMENT GUN COMPANY

"GUNITE" CONTRACTORS

GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.

"GUNITE" DIVISION WALL IN RESERVOIR

The "GUNITE" division wall illustrated is in the Clear Springs Reservoir, Borough of Northampton, Pa., and was built by us in 1923. This wall has a maximum thickness of 5" and is eight feet high. It is designed as a slab between "GUNITE" buttresses. For the past twenty-two years it has served perfectly its purpose of permitting the emptying of the reservoir by halves for periodic cleaning.

In 1941 we placed a reinforced "GUNITE" lining on the side walls of this same reservoir, one half at a time, and the division wall was carefully examined and found to be in perfect condition, with no cracks and no leaks or even minor seepage.

This work and scores of other "GUNITE" jobs of many types are described in our 74-page bulletin 2200. We will gladly send you a copy upon request.

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For strength and simplicity, only two parts are used — bearing bars which carry the load and have curved slots punched ABOVE THE NEUTRAL AXIS, and cross bars, of the same cross sectional area as the slot itself, pressed into these slots to distribute the load. No rivets, bolts or welds are required, thus eliminating the possibility of loose joints. Tri-Lok flooring comes in rectangular, diagonal and U shapes with Safety Steps — ask for Bulletin 1140 — DRAVO CORPORATION, NATIONAL DEPARTMENT, 300 Penn Avenue, Pittsburgh (22), Pa. (Distributor for THE TRI-LOK COMPANY)

DRAVO

POSTWAR PROJECTS (Cont'd.)

In., Ottumwa—City W... plans 25% completed by ... chant & Farmers Bank... 7 m.g. reservoir. Over ... ing Engineering Co., 501 ... sult. engr.

Mass., Whitman—Town ... Hall, survey made by M... sult. engrs., 1300 Sta... 34,150 ft. 8- to 12-in. c... Ave., Bedford, Temple ... Pine Sts. **$49,100.** Fina...

N. H., Northfield (ma... Rule Farm Homes Assn. ... completed by Lyford & ... State St., Concord, rein.-c... ming pool, 250,000 gal ... Financing not provided.

N. M., Roswell—City, ... completed WW distr. sys... ing, developing new wate... **000**; plans 10% complete... reservoir, **$175,000**; plans ... 000 lin. ft. 24 in. c.i. pipe ... **000.** Bond election soon ... guson Carollo & Classen, ... El Paso, consult. engr.

N. D., Napoleon—City, A. C. Plum, ... City Hall, WW imprvs. $81,000, Dakota Engineering & Constr. Co., Valley City, consult. engrs.

Okla., Holdenville—City, City Hall, plans 5% completed watermain extens., addnl. filter capacity at filter plant, **$40,000.** Financing not provided. C. H. Edge, Holdenville, consult. engr.

Okla., Canton—Town, plans 5% completed addnl. well and watermain exten., $25,000. Financing not provided. Alexander & Pollard, Terminal Bldg., Oklahoma City, consult. engrs.

Okla., Mangum—City, City Hall, plans 10% completed watermain extens., **$40,000.** Financing not provided. C. Lewis, Mangum, city engr.

Okla., Oklahoma City—City, C. F. Aurand, mgr., City Hall, plans 10% completed watermains extens., serving Edgemere Park Addn. **$175,000.** Financing not provided. M. B. Cunningham, City Hall, engr.

Okla., Stroud—Town, plans 15% completed addnl. well and pump. equip., **$25,000.** Financing not provided. C. W. James, Edmond, engr.

Okla., Shattuck—City, City Hall, plans 40% completed addnl. wells, pump. equip., watermains, **$75,000.** Financing not provided. Alexander & Pollard, Terminal Bldg., Oklahoma City, consult. engrs.

S. D., Sioux Falls—City, City Hall, plans 50% completed WW gallery and high pressure header, **$50,000**; well and collector lines, **$40,000**; plans filter plant and reservoir, **$200,000.** Financing not provided. R. E. Bragstad, City Hall, city engr. CD 5/4—ENR 5/18.

Tex., Baytown—Harris County Water Control & Imprvt. Dist. 7, Baytown, plans 5% completed over 20,000 lin. ft. c.i. watermains, over **$25,000**; rein.-con. underground water storage tank, **$50,000.** Financing not provided. J. J. Rady, Insurance Bldg., Fort Worth, consult. engr. CD 8/30—ENR 9/21.

Tex., Paris—City, J. W. Barnes, mayor, City Hall, plans 50% completed elevated tank and distr. sys., **$300,000.** Pitometer Co., 50 Church St., New York, N. Y., consult engrs. W. F. Hicks, City Hall, city engr. CD 4/21—ENR 5/4.

Vt., Burlington—City, City Hall, plans under way addnl. filter beds, coagulation basin and mixing chambers at filter plant, watermains, elevated tank, services, hydrants and meters, **$210,000.** Financing not provided. Whitman & Howard Co., 89 Broad St., Boston, Mass., consult. engrs. J. E. Moore, supt. Water Dpt. CD 8/25—ENR 9/7.

Wash., Milton—City, City Hall, preliminary surveys and plans completed exten. water distr. sys. **$50,000.** Financing not provided. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, consult. engrs.

Wash., Seattle—Water Dist. 61, c/o Parker & Hill, consult. engrs., Smith Tower, 2 and Yesler Sts., Zone 4, preliminary surveys and plans completed, exten. water distr. sys. in White Center area. **$108,000.** Financing not provided.

★**Wash., Spokane**—City, City Hall, plans under way reservoir, pump. station, wells, watermains, water tower. **$1,640,000.** Financing provided. C. E. Davis, City Hall, city engr. CD 9/29—ENR 10/19.

Wis., Waukesha—City, City Hall, plans under way water distr. sys. **$50,000.** Financing not provided. W. E. Dicks, City Hall, city engr.

READY FOR BIDS

N. M., Roswell—City, T. J. Hall, mayor, City Hall, plans completed 21,000 lin.ft. 24 in. c.i. supply lines, **$130,000**; WW distr. sys. extens., and drilling, developing water supply well, **$330,000.** Financing available. Headman, Ferguson, Carollo & Classen, 412 Martin Bldg., El Paso, Tex., consult. engrs. L. Rowland, City Hall, city engr.

O., Lockland—City, City Hall, plans completed installing 8- to 16-in. c.i. watermains, **$190,000.** A. LeFeber, Temple Bar Bldg., Cincinnati, consult. engrs.

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TAKE IT OFF!

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Used in more than 90% of the nation's coal stripping operations, Page AUTOMATIC dragline buckets dig through soapstone, shale and blasted rock in record time . . . and yet clean off the coal without tearing it up. Everywhere, it's Page AUTOMATIC-DIGGING-ACTION for increased yardage and reduced maintenance costs!

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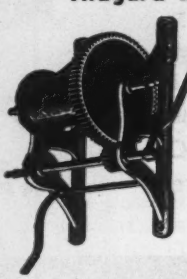

#6321 Winch
Single Drum
Single Purchase
With Brake
1200# Capacity

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POSTWAR PROJECTS [Cont'd.]

S. C., Spartanburg—City, WW Dpt., R. Simms, supt., City Hall, plans complete clear well and pump, $55,000. Wiedeman & Singleton, Candler Bldg., Atlanta, Ga., consult. engrs.

★**Tex., Dallas**—City, City Hall, plans completed over 25 mgd expan. filter plant, $687,500. Financing not available. Myers & Noyes, Tower Petroleum Bldg., Dallas, consult. engrs. (Revision—engineers). CD 1/4, ENR 1/25.

CONTRACTS AWARDED

S. C., Spartanburg—City, WW Dpt., City Hall, clear well and 8 mgd pump, to Fann Carter Constr. Co., Spartanburg, Est. $55,000. Wiedeman & Singleton, Candler Bldg., Atlanta, Ga., consult. engrs. R. E. Simms, supt. CD 2/14—ENR 3/8.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., Hollister—FIRE ALARM SYSTEM —City, City Hall, fire alarm sys. $40,000.

★**Conn., Norwalk**—City, C. F. Gregory, city engr., City Hall, storm and sanitary sewers in various streets, $250,000; sewage disposal plant, appurtenances addn., $250,000; incinerator, rubbish disposal imprvs., extens., $50,000. Financing not provided.

Ill., Joliet—State Dpt. Pub. Safety, Armory Bldg., Springfield, sanitary and storm sewerage sys. addn. and constructing sewage treatment works. $133,900.

Ill., Stateville (mail Joliet)—State Dpt. Pub. Safety, Armory Bldg., Springfield, increasing sanitary and storm sewerage sys. and constructing sewage treatment works, $272,950.

Ill., Urbana—University of Illinois, Urbana, sewer extens. (1st stage), Proj. 33, $40,000.

Ill., Vandalia — State Dpt. Pub. Safety, Armory Bldg., Springfield, sewage treatment works addn., Ill. State Farm Branch, Proj. 4. $41,200.

Pa., Evans City—Evansburg Boro, L. C. Lutz, secy., sewage treatment facilities. Over $25,000.

Pa., Garrett—Lower Yoder Twp., C. J. Kohler, secy., sewage treatment facilities, Lower Yoder Twp. Over $25,000.

Pa., Harmony Twp.—Harmony Twp., J. Yevak, secy., P. O. No. 42163, Unit Zone 1367, sewage treatment facilities. Over $25,000.

Pa., Johnstown—Dale Boro, F. Rhoades, secy., sewage treatment facilities, Dale Boro. Over $25,000.

Pa., Kittanning—Applewold Boro, c/o J. A. Hayes McDonald, secy., sewage treatment facilities, Applewold. Over $25,000.

Pa., Marcus Hook—Marcus Hook Boro, R. C. Rennie, secy., P. O. No. 42815, Zone 869, sewage treatment facilities. Over $25,000.

Pa., Morton—Morton Boro., G. E. Shubert, secy., P. O. No. 42990, Unit Zone 869, sewage treatment facilities. Over $25,000.

Pa., Norristown—Norristown Boro., W. S. Bowen, secy., P. O. No. 40680, Zone 866, sewage treatment facilities. Over $25,000.

Pa., Norwood—Norwood Boro, Wm. J. A. Kimber, secy., sewage treatment facilities. Over $25,000.

Pa., Phoenixville—Phoenixville Boro, N. D. Young, mgr., sewage treatment facilities. Over $25,000.

Pa., Port Allegany—Port Allegany Boro, F. S. Cook, secy., sewage treatment facilities. Over $25,000.

Pa., Pottstown—Pottstown Boro, Josephine Boyer, asst. secy., sewage treatment facilities.. Over $25,000.

Pa., Prospect Park—Prospect Park Boro, R. A. Homiller, secy., sewage treatment facilities. Over $25,000.

Pa., Reading—City, J. Clinton Bach, dir., sewage treatment facilities. Over $25,000.

Pa., Ridley (Ridley Park P. O.)—Ridley Twp., G. L. Garling, secy., sewage treatment facilities. Over $25,000.

Pa., Ridley Park—Ridley Park Boro, N. E. Hoopman, secy., sewage treatment facilities. Over $25,000.

Pa., Rochester—Rochester Boro, B. F. Ellis, secy., sewage treatment facilities. Over $25,000.

Pa., Rouseville—Rouseville Boro, G. H. Brush, secy., sewage treatment facilities. Over $25,000.

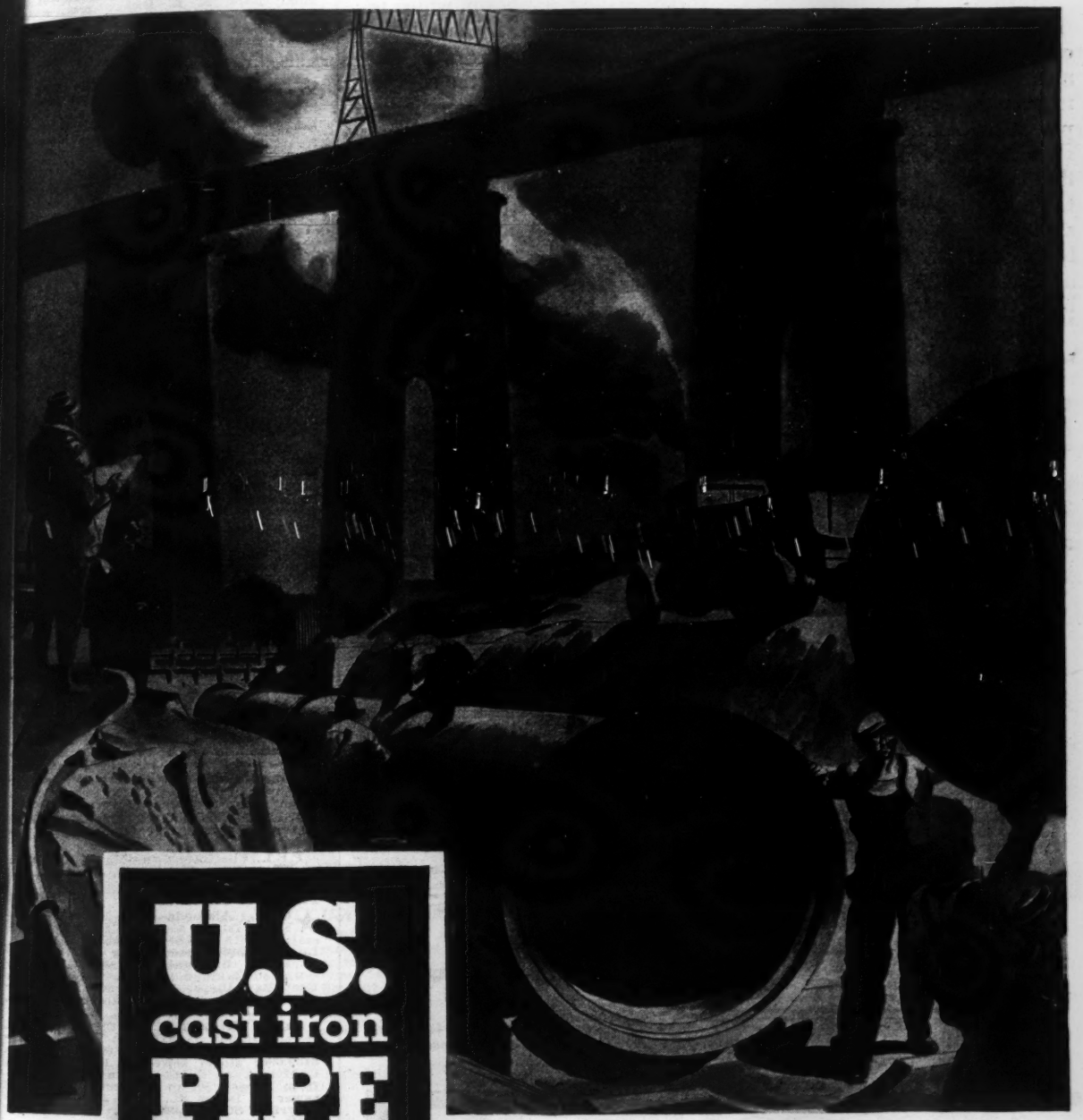
Pa., Royersford—Royersford Boro, B. Detwiler, secy., sewage treatment facilities. Over $25,000.

Pa., Rutledge—Rutledge Boro, E. A. Weiss, secy., sewage treatment facilities. Over $25,000.

Pa., Scottdale — Scottdale Boro, H. G. Frank, secy., sewage treatment facilities. Over $25,000.

Pa., Sharon Hill—Sharon Hill Boro, J. A. Pfister, secy., sewage treatment facilities. Over $25,000.

If your present or postwar plans call for large diameter pipe and special fittings why not avail yourself of the advisory service of our technical staff? Out of our long experience we are frequently able to suggest adaptations of design principles which have proved efficient and economical in other installations. Our facilities are extensive and include a specialized plant for the production of fittings.



Drawn for U. S. Pipe & Foundry Co. by Peter Helck

Manganese Steel "*Glove*" Protects Business End of Dredge Dipper Stick

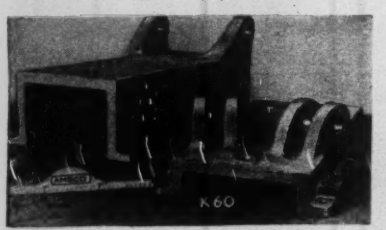
The dipper sticks on dredges are usually subjected to abusive service. They receive many violent impact shocks from submerged rocks and logs, and also come in contact with abrasive materials such as gravel.

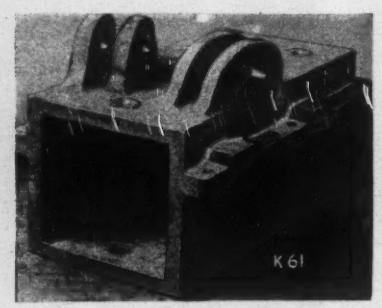
During the past thirty years, Amsco has on a number of occasions been called upon to furnish socket castings designed to fit over the end of a dredge dipper stick. Austenitic manganese steel has the toughness to resist the impacts and stresses inevitable in this work, and at the same time is incomparably the best metal for withstanding the abrasive action of the material being dredged.

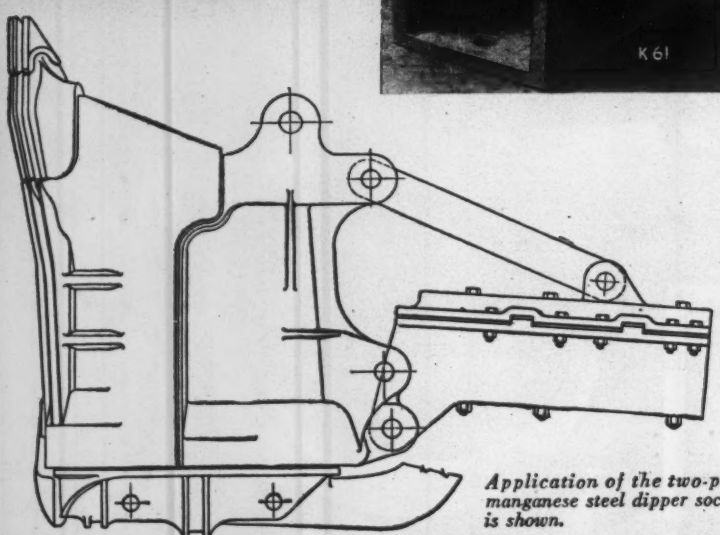
A two-part manganese steel socket is shown in Pictures K-60, K-61 and the accompanying sketch. Two of these units were recently made for a dredging company; the larger weighing 11,000 lbs. and the other 7,300 lbs.

The dipper is attached to this socket casting, as shown, which is bolted to the stick by means of the cored holes shown in the top and bottom section of the socket.

This is just one of many manganese steel units which have proved their worth on dredges of all types. Our recent bulletin, No. 844-D, entitled "Amsco Manganese Steel—The Toughest Steel Known—For All Dredging Purposes", pictures these applications as well as Amsco dredge pumps and shows some of the dredges on which they are used.







Application of the two-part manganese steel dipper socket is shown.

Amsco
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AMERICAN Brake Shoe COMPANY

POSTWAR PROJECTS (Cont'd.)

Pa., Sheffield — Sheffield Twp., H. G. Roberts, secy., sewage treatment facilities. Over **$25,000.**

Pa., Smethport (East Smethport P. O.)—Smethport Twp., F. [illegible] Biever, secy., sewage treatment facilities. Over **$25,000.**

Pa., Somerset—Somerset Boro, R. Pile, secy., sewage treatment facilities. Over **$25,000.**

Pa., South Coatesville (mail Coatesville)—South Coatesville Boro, J. Holland, secy., sewage treatment facilities. Over **$25,000.**

Pa., South Connellsville—South Connellsville Boro, C. E. Weyand, secy., sewage treatment facilities. Over **$25,000.**

Pa., South Greensburg (mail Greensburg)—South Greensburg Boro, G. W. Goulding, secy., sewage treatment facilities. Over **$25,000.**

Pa., Southmont (mail Johnstown)—Southmont Boro, S. E. Dick, pres., sewage treatment facilities. Over **$25,000.**

Pa., Southwest Greensburg (mail Greensburg)—Southwest Greensburg Boro, J. Clarence Shrader, secy., sewage treatment facilities. Over **$25,000.**

Pa., Spring City—Spring City Boro, N. Mowrey, secy., sewage treatment facilities. Over **$25,000.**

Pa., Springfield (Media P. O.)—Springfield Twp., J. W. Calder, secy., sewage treatment facilities. Over **$25,000.**

Pa., Tionesta—Tionesta Boro, M. A. Carringer, secy., sewage treatment facilities. Over **$25,000.**

Pa., Trainer (Marcus Hook P. O.)—Boro of Trainer, R. Sakers, secy., sewage treatment facilities. Over **$25,000.**

Pa., Upper Darby—Upper Darby Twp., J. E. Malone, secy., sewage treatment facilities. Over **$25,000.**

Pa., Vanport—Vanport Boro, H. C. Funkhouser, secy., sewage treatment facilities. Over **$25,000.**

Pa., Warren—Warren Boro, M. L. Dougherty, secy., sewage treatment facilities. Over **$25,000.** CD 2/1/43—ENR 2/4/43.

Pa., Waynesburg—Waynesburg Boro, E. W. Scott, secy., sewage treatment facilities. Over **$25,000.**

Pa., West Conshohocken (br. Conshohocken)—West Conshohocken Boro, W. N. Hannum, secy., sewage treatment facilities. Over **$25,000.**

Pa., Westmont (mail Ebensburg)—Westmont Boro, V. Raab, secy., sewage treatment facilities. Over **$25,000.**

Pa., West Newton—West Newton Boro, J. R. Medsger, secy., sewage treatment facilities. Over **$25,000.**

Pa., West Reading (mail Reading)—West Reading Boro, H. Rickenbach, mgr., Zieber & Snyder, attys., Reading, sewage treatment facilities. Over **$25,000.**

Pa., White Haven—White Haven Boro, W. M. Park, secy., sewage treatment facilities. Over **$25,000.**

Pa., Wilson (mail Easton)—Wilson Boro, J. B. Acton, secy., sewage treatment facilities. Over **$25,000.**

Pa., Wyomissing—Wyomissing Boro, W. G. Wade, pres., sewage treatment facilities. Over **$25,000.**

Pa., Yeadon (br. Lansdowne) — Yeadon Boro, F. R. Culp, secy., sewage treatment facilities. Over **$25,000.**

Pa., Youngwood—Youngwood Boro, H. H. Henderson, secy., sewage treatment facilities. Over **$25,000.**

★ **Que., Montreal** — Municipality, collector sewer for upper water shed between Mount Royal Park and River. **$500,000.**

Tex., Galveston—City, City Hall, sewage disposal sys. **$250,000.** Financing not provided.

P.E.I., Charlottetown—Municipality, storm sewers in King, Dorchester, School and Orlebar Sts. **$50,000.**

PLANS UNDER WAY

★ **Calif., Alameda**—City, City Hall, Bay Farm Island sewage plan, installing lift station with discharge line to Krusi Park Lift, **$90,500**; intercepting sanitary sewer lines and lift stations delivering sanitary sewer to Oakland main in conjunction with East Bay Disposal plan, **$425,000**; sanitary sewer lines and laterals, storm sewers, **$71,200.** C. Froerer, City Hall, city engr.

Calif., Berkeley—City, City Hall, extension sewers Gilman St. **$110,000**; Virginia St. **$90,000**; University Ave. **$70,000**; Ashby Ave. **$130,000**; storm sewer in Russell St. from California to Grant Sts. and in Grant St. from Russell St. to Bancroft Way, **$24,000**; sewer in Dover St., from Alcatraz Ave. to Warring St., **$14,000.** H. Goodridge, City Hall, city engr.

★ **Calif., Long Beach**—City, City Hall, bond election May 8, sewage disposal plant, **$3,300,000.** Metcalf & Eddy, Statler Bldg., Boston, Mass., consult. engrs. G. E. Baker, City Hall, city engr. CD 12/6—ENR 12/23.

★ **Calif., Los Angeles**—City, City Hall, 1 mi. submarine outfall sanitary sewer at Hyperion, **$1,375,000**; repairing North Outfall sanitary sewer, **$999,900**; disposal plant for

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- heating asphalt, oils, bituminous material in tank cars or storage tanks.
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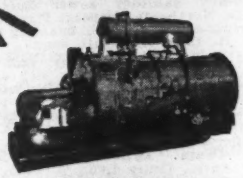

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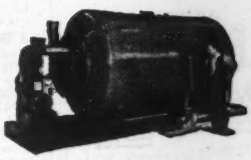
Completely self contained; highly efficient; require only simple piping connections to place in operation. Fully automatic fuel-oil burner; condensate recovery and feed water pumping system; no stack needed, sizes from 20 to 500 h.p.; pressures 15 to 200 lbs.



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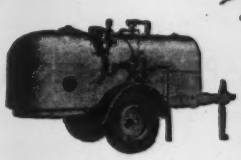

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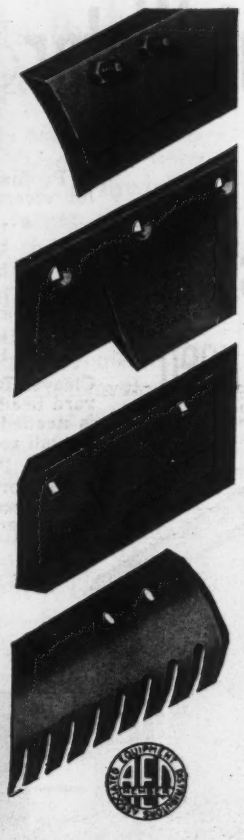

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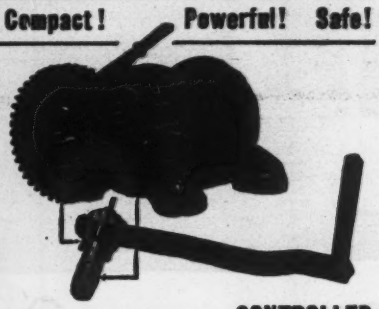

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POSTWAR PROJECTS (Cont'd)

fish cannery wastes at Fish Harbor, $[illegible] 000; relief and intercepting sanitary sewers, $500,000; repairing central Outfall sanitary sewer, $463,100; sanitary sewage treatment plant at Terminal Island, $275,000; Fig Ave. sewage pumping plant, $51,000. Aldrich, City Hall, city engr.

★ **Calif., Los Angeles**—City, City Hall, [illegible] 000,000 bond election Apr. 1; sewage treatment plant at Hyperion, $25,000,000. L. Aldrich, City Hall, city engr. CD [illegible] ENR 5/18.

★ **Calif., Modesto**—City, City Hall, [illegible] election in April, imprv. sewerage system, $600,000. F. J. Rossi, City Hall, city engr. CD 11/15—ENR 11/30.

★ **Calif., Sacramento**—City, City Hall, [illegible] relief sewers, $1,638,000; repairs and replacements filter plant and tanks, $40,000. F. Klaus, City Hall, city engr. CD 2/4/44—ENR 2/24/44.

★ **Calif., San Francisco**—City and San Francisco Co., City Hall, North Sewage Disposal Plant, $5,500,000. Metcalf & Eddy, Statler Bldg., Boston, Mass., and C. C. Kennedy, 604 Mission St., consult. engrs. CD 11/15—ENR 11/30.

Conn., New London—City, Municipal Bldg., outfall sewer part of central sys. Cost, $25,000. Financing not provided. H. E. Holmes, Municipal Bldg., engr.

★ **Ill., Rock Island**—City, Dpt. P. Wks., City Hall, sewer extens., treatment plant addn. $3,000,000. W. J. Gallagher, City Hall, city engr.

★ **Mass., Lee**—Town, L. A. Airoldi, supt. and engr., Town Hall, sewerage sys. Approx. $500,000. Financing not provided.

Mich., Albion—City, City Hall, sewage treatment plant, interceptor sewers, $150,000. H. A. Rieger, City Hall, city engr.

Minn., South St. Paul—City, J. O'Donnell, clk., City Hall, voted $420,000 bonds, trunk and intercepting sewers. R. C. Munson, City Hall, city engr. CD 1/17—ENR 2/1.

★ **Miss., Gulfport**—Bd. Supervs., Gulfport, plans 50% completed repairing concrete sea wall correcting drainage and pumping sand beach. $1,185,824. Financing not provided. H. D. Shaw, Gulfport, assoc. engr. G. R. Boddie, P. O. Box 608, co. engr.

N. J., Carteret—Carteret Boro, Boro Hall, Cooke Ave., sewage treatment plant. $30,000 or more. Wm. A. Goff, Broad St., Station Bldg., Phila., Pa., consult engr.

N. J., Clayton—Clayton Boro, Boro Hall, sewage disposal plant, pump. station and 11 mi. sewers, $250,000 plus. Wm. A. Goff, Broad St. Station Bldg., Phila., Pa., consult. engrs.

★ **N. Y., Jamestown**—City, C. J. Stromburg, Dpt. P. Wks., City Hall, sewage treatment and disposal plant. $1,000,000. Financing not provided. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. CD 11/24/43—ENR 12/2/43.

N. D., Napoleon—City, A. C. Plum, clk., City Hall, sewerage sys. $72,000. Dakota Engineering & Constr. Co., Valley City, consult. engrs.

O., Chagrin Falls—Village of Chagrin Falls, G. C. Nichols, mayor, 21 Washington St., sewer lines, disposal plant, $100,000. C. W. Courtney, 1771 E. 11 St., Cleveland, engr.

O., Struthers—City, City Hall, incinerator, $60,000. Land rights not cleared, financing not provided. D. A. Richards, Struthers, city engr.

Okla., Oklahoma City—City, C. F. Aurand, mgr., City Hall, plans 15% completed Edgemere Park sanitary sewer outfall from 36 St. to Northside Disposal Plant, $200,000. Land rights not cleared, financing not provided. R. Lee, City Hall, engr.

Ore., Medford—City, City Hall, F. H. Rogers, supt., plans under way enlarging sewage disposal plant, $200,000; exten. sewage sys., $80,000. Financing not provided. John W. Cunningham & Associates, 1112 Spalding Bldg., Portland, consult. engrs. CD 1/19—ENR 7/13.

Pa., Crum Lynne—Central Delaware County Auth., Crum Lynn, 6 m.g.d. primary sewage treatment plant. Damon & Foster, Sharon Hill, consult. engrs. CD 2/19, under Swarthmore.

Pa., Scranton—City, City Hall, Zone 1, reconstructing cave damaged by storm and combined sewers and building storm sewers, $153,772. Financing not provided. Bureau of Engineering, G. H. Wilton, City Hall, Zone 3, engr.

S. D., Sioux Falls—City, City Hall, plans 50% completed storm sewers, $40,000; sanitary sewers and lift stations, $60,000. R. E. Bragstad, City Hall, city engr.

Tex., Baytown—Harris County Water Control & Imprvt. Dist. 7, Baytown, plans 5% completed sanitary sewer collection lines, imprvs., $40,000 or more; sewage disposal plant, $60,000; storm sewers, $75,000; plans drainage, $30,000. Financing not provided. J. J. Rady, Insurance Bldg., Fort Worth, consult. engrs. CD 2/2—ENR 2/22.

Tex., Brownwood—City, City Hall, plans 80% completed storm sewers, $75,000; garbage collection and disposal, $26,000. Financing not provided. C. W. McClelland, 1209 Durham St., city engr. CD 4/21/44—ENR 5/4/44.

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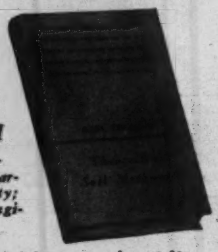

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POSTWAR PROJECTS (Cont'd.)

Tex., Gonzales—City, City Hall, plans 50% completed sewage disposal plant. $60,000. Bond election March 1. Garrett Engineering Co., 1816 Milam St., Houston, consult. engr.

★**Vt., Burlington**—City, City Hall, plans under way, sanitary and storm combined sewer, treatment plant, incl. waste disposal, sub-pump. station and small unit treatment plants for isolated outfall, $970,000. Land rights not cleared and financing not provided. G. C. Stanley, City Hall, city engr. CD 8/25—ENR 9/7.

Wash., Grand Coulee—City, City Hall, preliminary surveys and plans completed sewer and water sys. $465,000. Financing not provided. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, consult. engrs.

Wash., Leavenworth—City, City Hall, preliminary plans and surveys completed sewer and water distr. sys. $220,000. Financing not provided. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, consult. engrs.

Wash., Newport—City, City Hall, bond election in April or May, trunk sewer, $35,000; treating plant, $15,000; lateral sewers, $90,000. H. A. Sewell, City Hall, city engr. CD 11/22—ENR 12/14.

★**Wash., Puyallup**—City, City Hall, plans under way sewerage sys. with disposal plants, storm and sanitary sewers. $685,000. City to vote March 6 on financing. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, consult. engrs. CD 2/13—ENR 2/8.

Wash., Seattle—Roxbury Sewer Dist., c/o Parker & Hill, consult. engrs., Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, preliminary surveys and plans completed, sewerage sys. and disposal plant, south of here, $160,000. Financing not provided.

Wash., Snohomish—City, City Hall, preliminary surveys and plans completed, sewerage sys. and disposal plant, $275,000. Financing not provided. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, consult. engrs.

Wash., Tacoma—Hyada Park Sewer Dist., c/o Parker & Hill, engrs., Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, preliminary surveys and plans completed sewerage sys. $27,000. Financing not provided. STOP 15:28

★**W. Va., South Charleston**—Town, complete storm sewerage sys.; sewage disposal plant, incinerator, sewage pump. station, sewage intercepting sewer, $1,144,000. Land rights not cleared, legal obstacles to be overcome, financing not provided. M. C. Catlette, City Hall, engr.

W. Va., Wheeling—City, City Hall, plans 25% completed storm and sanitary sewerage sys. for Wheeling Island, consisting 18- to 60-in. rein.-con. sewer pipe with necessary catchbasins, manholes, headwalls and spillways and street restoration, $180,000; plans 75% completed 2,764 lin.ft. 24- to 54-in. rein.-con. storm and sanitary sewers, incl. jacking 480 lin.ft. 54 and 42 in. pipe under railroad sidings and crossings, manholes and catchbasins, moving 8 in. water line and street restoration, on Eoff St., 12 St. to Wheeling Creek, $68,000. J. C. Boyd, City Hall, asst. city engr.

Wis., Neenah—City, 208 S. Commercial St., plans 50% completed garbage disposal plant, $40,000; plans 75% completed settling basin and sludge pump. station removing clay now being dumped into interceptor line, $35,000, land rights not cleared. A. G. Prunuske, City Hall, engr. CD 12/22/43—ENR 1/13/44.

Wis., Waukesha—City, City Hall, plans under way sanitary sewers, $100,000; storm sewers, $100,000; disposal plant, $150,000. Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waukesha—City, City Hall, plans completed sanitary sewers, $141,500. Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waukesha—City, City Hall, incinerator, $25,000. Financing not provided. W. E. Dick, City Hall, city engr.

Wyo., Cheyenne—City, City Hall, plans 90% completed sewers. $200,000. T. H. Baldwin, City & County Bldg., consult. engr. H. G. Watson, City Hall, city engr.

READY FOR BIDS

★**Fla., Tampa**—City of Tampa and Hillsborough Co., Tampa, plans completed sewerage sys. covering 120 sq. mi. of city and addnl. 100 sq. mi. of surrounding territory in Hillsborough Co. $3,690,028. Financing available. F. J. Fagan, City Hall, city engr.

N. Y., Fayetteville—Village, Municipal Bldg., plans completed sewerage sys. and treatment plant, $280,000. G. D. Holmes & Wm. S. Gere, 117 James St., Syracuse, consult. engrs. CD 2/25/44—ENR 3/9/44.

BRIDGES

PROPOSED WORK

Calif., Elkton—Yolo Co., Court House, Woodland, bridge over Sacramento River. $250,000.

Colo., Denver—City and Denver Co., City Hall, exten. 14 St. viaduct and widen present structure. $200,000.

Idaho—State Bureau Hys., Boise, T. Halley, dir., plans under way 1,200 rein.-con. bridge across Clearwater River, Lewiston. $500,000. Financing not provided.

★**N. J., Bergenfield**—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpasses on the New York Central R. R. line, for grade crossing elimination. $250,000.

N. J., Camden—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpass on Penn. R.R. for grade crossing elimination. $300,000.

N. J., Convent Station—State Bd. Public Utility Comrs., 1060 Broad St., Newark, eliminating grade crossing at Convent Station of Delaware & Lackawanna and Western R. R. $60,000.

★**N. J., Dover**—State Bd. Pub. Utilities Comn., 1069 Broad St., Newark, 3 overpasses on Delaware, Lackawanna & Western R. R., for grade crossing elimination. $1,000,000.

★**N. J., Dumont**—State Bd. Pub. Utilities Com., 1060 Broad St., Newark, 2 overpasses on New York Central R. R., for grade crossing elimination. $500,000.

★**N. J., Dunellen**—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpass and 2 underpasses on Penn. R. R. for grade crossing elimination. $1,250,000.

N. J., Garwood—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, underpass on Jersey Central R.R. for grade crossing elimination. $400,000.

★**N. J., Harrington Park**—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, 3 overpasses on New York Central R. R. for grade crossing elimination, $590,000.

N. J., Haworth—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpass on New York Central R. R., for grade crossing elimination, $170,000.

N. J., Hopewell—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpass on Reading R. R., for grade crossing elimination. $160,000.

★**N. J., Jersey City**—State Bd. Public Utility Comrs., 1060 Broad St., Newark, concrete overpass for eliminating grade crossing of Lehigh Valley R. R. $710,000.

N. J., Manville—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, underpass on Lehigh Valley R. R., for grade crossing elimination, $280,000.

N. J., Matawan—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, underpass on New York & Long Branch R. R., for grade crossing elimination. $300,000.

N. J., New Market—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, concrete overpass on Lehigh Valley R. R. for grade crossing elimination. $200,000.

N. J., Paterson—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, plans underpass and overpass on New York, Susquehanna & Western R. R. $265,000.

N. J., Pennsauken—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, 2 overpasses on the Penn. R. R., for grade crossing elimination. $380,000.

N. J., Ramsey—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, plans concrete underpass on Erie R. R. $300,000.

★**N. J., Red Bank**—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, plans elevating New York & Long Branch R. R. $1,800,000.

N. J., Roselle Park—State Bd. Public Utility Comrs., 1060 Broad St., Newark, eliminating grade crossing at Lorraine Station of Jersey Central R. R. with concrete steel underpass. $250,000.

N. J., South Plainfield—State Bd. Pub. Utilities Comn., 1060 Broad St., Newark, overpass on Lehigh Valley R. R. $260,000.

Tex., Jasper—Jasper Co., A. Turner, Judge, Jasper, one 200 ft. clear span, two 100 ft. approach spans, forty 40 ft. spans relief opening, concrete, steel bridge. $300,000. Financing not provided.

Tex., Jasper—City, M. P. Hancock, mayor, City Hall, streets, bridges, $250,000. Financing not provided.

PLANS UNDER WAY

★**Calif., Alameda**—City, City Hall, Fruitvale Ave. bridge, $1,250,000; overpass over Webster St. on Lincoln Ave., $200,000. C. Froerer, City Hall, city engr.

Calif., Oakland — Alameda Co., Court House, Oakland, 4 bridges on Mines Rd. near Livermore, $42,000; reconstruction and bridge construction on Marsh Rd. $147,000. W. B. Boggs, Court House, co. surveyor and civil engr.

Calif., Sacramento — Sacramento Co., Court House, bridges on Stockton Blvd., Lemon Hill and Power Inn Rds., $5,100; Indiana Ave., Old Marysville and North Grant Line Rds., $24,700; on Rio Linda Blvd., Howe and Hurley Aves., $5,000; Willow Ave. and Old Marysville Rd., Marysville Blvd. and North County area, $17,100; Elder Creek, Franklin Blvd. and Jackson Hy., $9,500; Calif. Vineyward Rd., Stockton Blvd. and Sheldon Sloughhouse Rd., $5,200; Gerber Rd., between Stockton Blvd. and

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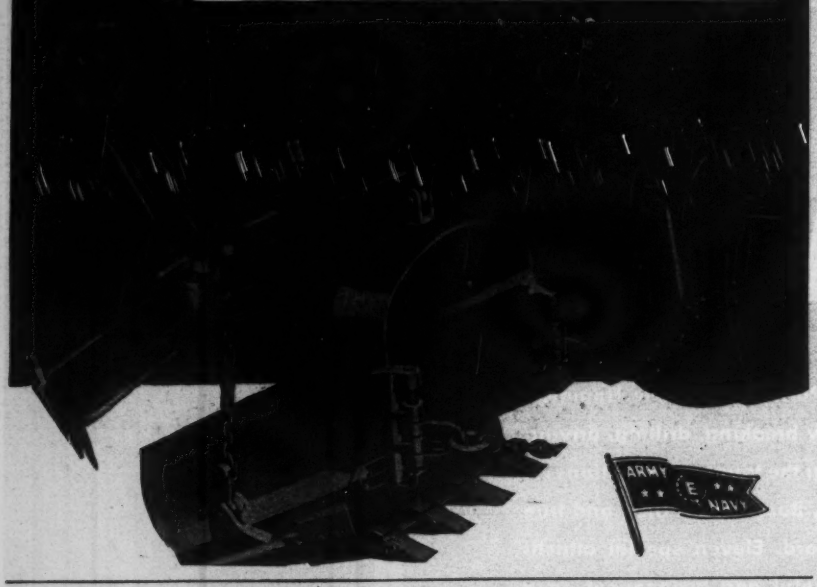

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152 Glenwood Ave., Medina, N. Y.

POSTWAR PROJECTS (Cont'd.)

Sheldon Sloughhouse Rd., **$7,800**; Whitney-Watt and Walnut Aves., **$3,800**; Christensen-Rd., New Galt-New Hope Rd. and Wilson-Ferguson Rd., **$9,500**; Mariposa, Olive and Twin Oaks Aves., **$21,900**; Hazel Ave., Park Oaks and North County Line, **$5,000**; Galt and Galt West, Galt and Christensen Rds., **$7,600**; Cottage Way, 20 St. and Walnut Ave., **$12,300**; Osage-Orange Florin Rd. and Jackson Hy., **$13,300**; Franklin and Marengo Aves., Arcade Blvd., **$5,100**; Alta Mesa Rd., Ione Hy., and Dillard-Sloughhouse Dr., **$12,400**; Gum Tree Rd. and South Ave., McClellan Field and North Grant Line Rd., **$7,200**; Meadowview Farm Rd., Franklin and Freeport Blvds., **$15,700**; McKenzie and Arno Rds., Ione Hy., **$42,000**; Bottimore Rd., Ione Hy. and north and east for about 5 mi., **$14,000**; Gerald East, Ione Hy., and eastern area of county, **$6,600**; Drive Rd. bridges, McClellan Field and North County Line, **$13,000**; E St. bridges, Dry Creek Rd. and Watt Ave., **$23,800**; Antelope East Bridge, Antelope and Auburn Rds., **$9,300**; Twitchell Island Bridge, **$93,000**; Madison Ave. Bridge, Manzanita Ave. and Hy. 99, **$18,000**. A. Kiefer, Court House, acting co. engr. CD 10/18/43—ENR 10/21/43.

Ill., Rock Island—Rock Island Co., Court House, M. F. Norby, supt. hys., plans 40% completed 6 major bridges, **$310,000**.

★**Mich., Detroit**—City Dpt. P. Wks., City Hall, plans under way rein.-con., steel span grade separation, carrying Warren Ave. under Grand Trunk R. R. **$710,000**. G. R. Thompson, City Hall, city engr. CD 3/30/43—ENR 4/1/43.

Minn., Thief River Falls—City, P. G. Pederson, clk., bridge over Red Lake River on First St. Over **$25,000**. P. A. Helseth, 5309 35 Ave. S., Minneapolis, consult. engr.

★**Miss., Gulfport**—Harrison Co., Gulfport, plans 10% completed wood, I-Beam, concrete, and swing bridges, $660,441. Financing not provided. Geo. R. Boddie, P. O. Box 448, co. engr.

Missouri—State Hy. Comn., Jefferson City, plans 90% completed 45 ft. I-beam span bridge exten., steel pile end bents, over Maries Des Cygnes River Drainage Ditch, road from Butler to Rich Hill, Route 71, Proj. FA 187 FA, Bates Co., **$8,100**; 14 ft. rein.-con., slab span culvert type bridge over stream, road from Springfield to Republic, Route 14, Proj. FA 457 D1, Greene Co., **$10,000**; five 20 ft. rein.-con., slab span, concrete bents on timber pilling, over Foreman Branch, road from Memphis to Kahoka, Route 4, Proj. PW-FA 218 C, Scotland Co., **$30,000**; three 25 ft., rein.-con., slab span, bridge, rein.-con. pile bents, over Swan Pond Creek, road from Advance to Bloomfield, Route 25, Proj. 187 (3), **$15,000**; three 25 ft., rein.-con. slab span, bridge over Branch of Wolf Creek, road from Advance to Bloomfield, Route 25, Proj. FA 187 (4), **$13,000**; three 25 ft., rein.-con., slab span bridge over Wolf Creek, road from Advance to Bloomfield, Route 25, Proj. 187 (4), **$13,000**; three 25 ft., rein.-con., slab span bridge, rein.-con. pile bents, over Main Ditch 17, road from Advance to Bloomfield, Route 25, Proj. FA 187 (3), **$14,000**; three 25 ft., rein.-con. slab span bridge, rein.-con. pile bents, over overflow of Main Ditch 17, road from Advance to Bloomfield, Route 25, Proj. FA 187 17, **$15,000**; four 45 ft., rein.-con., deck girder span bridge, 3 rein.-con. bents to rock and 2 rein.-con. pile bents over Old channel of Castor River, road from Advance to Bloomfield, Route 25, Proj. 187 (4), **$48,000**, all foregoing Stoddard Co. C. W. Brown, ch. engr.

★**Ohio**—State Hy. Dpt., Columbus, surveying site grade crossing elimination, Vine St., in Willoughby, Lake Co. **$700,000**. J. H. Mainey, 47 N. Park Pl., Willoughby, resident engr.

O., Akron—Summit Co., Akron, 1 bridge, **$140,000**. A. C. Ranney, Akron, co. engr. CD 11/24/43—ENR 12/2/43.

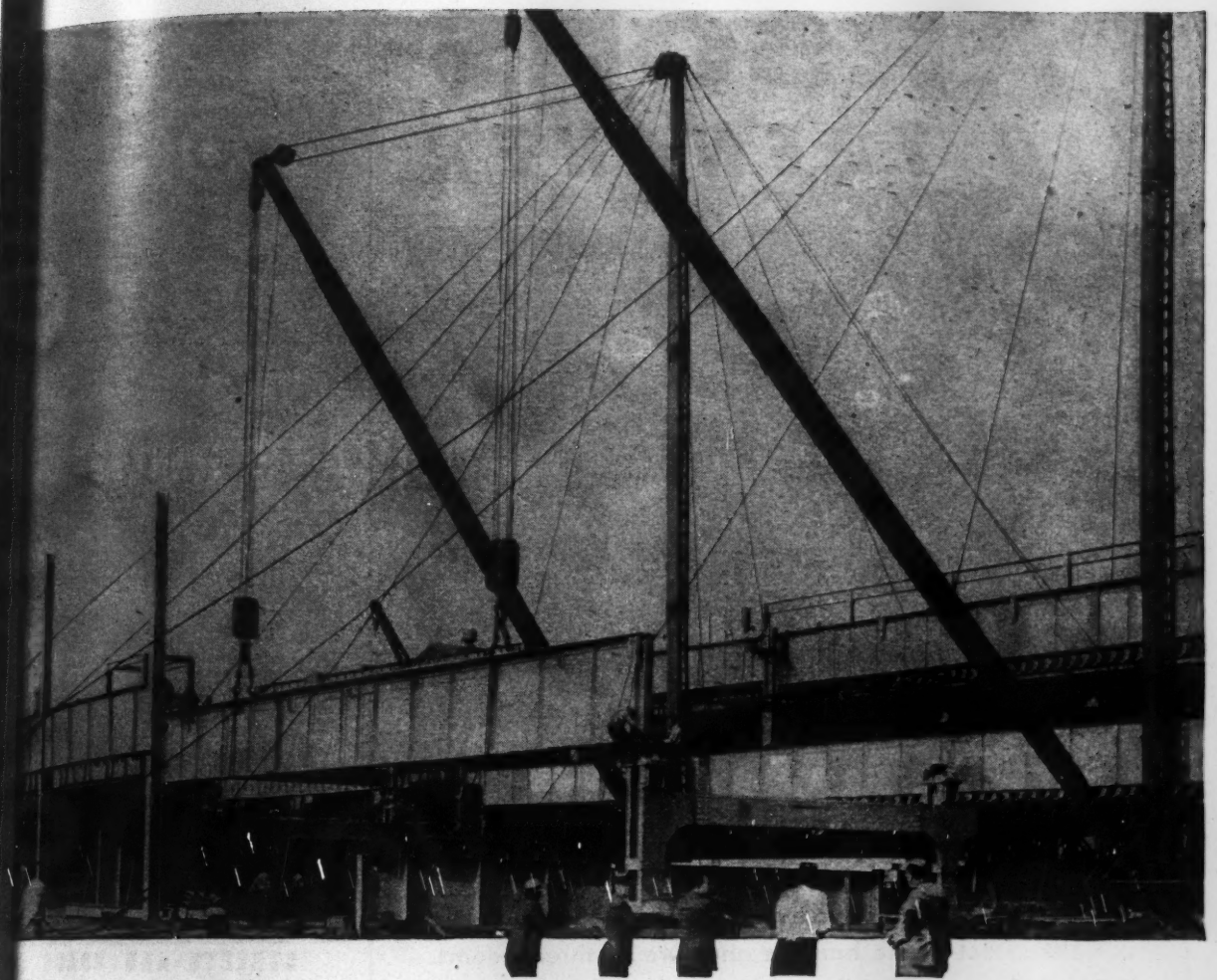
★**O., Akron** — Summit Co., Akron, plans 50% completed high level bridge. **$1,000,000**. Wilbur Watson & Associates, 4614 Prospect St., Cleveland, consult. engrs. A. F. Ranney, Akron, co. engr. CD 1/12/44—ENR 1/27/44.

★**O., Dayton** — Montgomery Co., Court House, widening, reinforcing and building new bridges and culverts, incl. widening 672 concrete bridges, **$180,000**; replacing 276 concrete bridges, span from 4 to 200 ft., **$1,800,000**; widening or lengthening 1272 pipe culverts, **$100,000**; widening 1,332 rein.-con. box culverts, **$200,000**; replacement of 1,224 bridge head walls, **$160,000**; county highway and railroad grade separations (7), **$2,000,000**. Financing not provided. C. H. Bauer, Dayton, co. hy. engr.

O., Lima—Comrs. Allen Co., Court House, plans 30% completed 50 bridges. **$250,000**. H. M. Mumaugh, Lima, co. engr.

O., Struthers—City, City Hall, grade separation. **$150,000**. Land rights not cleared, financing not provided. D. A. Richards, Struthers, engr.

O., Wooster—Comrs. Wayne Co., Wooster, plans 5% completed bridges, **$125,000**. Financing not provided. W. H. Metzler, Court House, co. engr. CD 12/27/43—ENR 1/13/44.



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Yes, it's a prewar picture, taken at a time when heavy construction work of this type was common all over the country. But, in a way, it's also a preview of future activity—a hint of things to come.

All signs point to a postwar era of new bridges, highways, skyscrapers, dams. An era of building for peace. There will be more Purple Strand Form-Set available for derrick booms, hoist lines, cranes, and clamshells. As always, this top-grade preformed rope will be flexible, durable, highly resistant to bending fatigue . . . and tough as only premium steel can be. It will warrant your confidence, just as it always has in the past.

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Be sure that you're getting maximum results from your present supply of Purple Strand. It's built for hard work, but you can prolong its life by observing a few simple rules.

First of all, equip your machines with rope of the proper construction. Keep the rope properly lubricated at all times. Look out for sheaves that are damaged, abraded, or out of line—they're sources of trouble.

And, even though Purple Strand is precious nowadays, you'll find it good practice, occasionally, to cut off a short length from the drum end of your rope. This will relocate the "grief spots"—the spots of heaviest wear.

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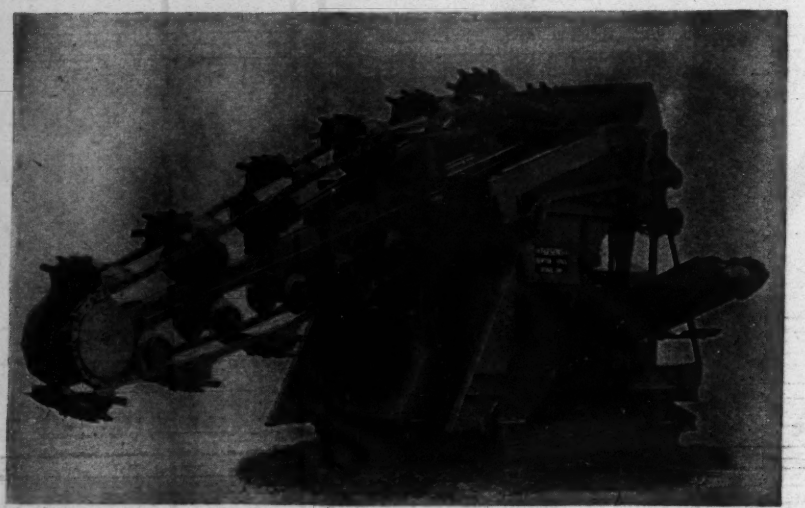
310 TRENCHER



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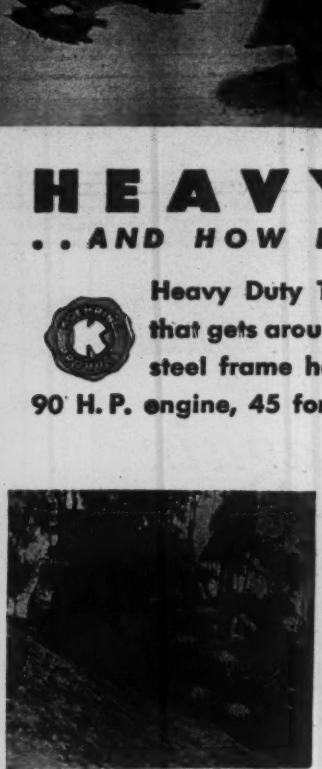
Heavy Duty Trencher, with built-in flexibility that gets around every digging problem. Heavy steel frame handles one, two or three booms. 90 H. P. engine, 45 forward, 5 reverse traction speeds. Depth adjustment made easy with telescoping boom. Maximum depth: 15 feet. Digging widths: 18 to 54 inches. Offset boom sidesteps obstructions by shifting right or left across full width of boom carriage. Three point frame suspension keeps machine level, ditch vertical even though one crawler is higher than the other. Arc type conveyor can be shifted while machine digs.



Strength: Heavy Duty construction and ample engine power permits use of double or triple booms on the Parsons 310.

THE PARSONS COMPANY
KOEHRING SUBSIDIARY **NEWTON, IOWA**

TRENCHING EQUIPMENT

POSTWAR PROJECTS (Cont'd.)

★**Pa., Scranton**—[illegible] City Hall, [illegible] replacing obsolete [illegible] bridges, [illegible] Financing not provided. Bureau of Engineering, G. H. Wilson, City Hall, [illegible] engrs.

★**Texas and Mexico**—State Hy. Dept., Austin, Gentry, chn., Austin, Tex., plans to award completed 1,400 ft. toll-free vehicle and pedestrian steel deck girder span bridge across Rio Grande River, between Laredo, Tex., and Nuevo Laredo, Mexico, $[illegible]. Financing not provided. D. C. Greer, Austin, Tex., state hy. engr. CD 8/13/43—ENR 8/26/43.

Wash., South Bend—Pacific Co., South Bend, plans 15% completed wood truss bridges. $25,000. Financing provided. R. L. Woodward, South Bend, co. road engr.

Wash., Stanwood—Snohomish Co., County House, Everett, steel vertical lift bridge and approach spans, 100 ft. horizontal opening and 60 ft. vertical clearance at high tide, $200,000. R. Crane, Court House, co. engr.

W. Va., Wheeling—City, City Hall, plans completed 4 span, 182 ft., concrete, arch bridge, 1 new concrete abutment, 2 concrete piers, reusing 1 old stone abutment and 1 old stone pier, over Wheeling Creek replacing obsolete bridge on Schenck St. $[illegible]. Financing not provided. Harrington & Cortelyou, Dwight Bldg., Kansas City, Mo., consult. engrs. V. J. Armbruster, City Hall, city engr.

★**W. Va., Wheeling**—City, City Hall, plans 4 span, 200 ft. steel girder or I-beam bridge, 4-lane traffic, over Wheeling Creek at Fleming and exten. concrete paving to National Rd. (U. S. Route 40), $80,000; 12 span, [illegible] concrete piers, 2 concrete abutments, 1,[illegible] ft. steel bridge, from 16 to McColloch St., to Rock Point Rd., $750,000. Financing not provided. Harrington & Cortelyou, Dwight Bldg., Kansas City, Mo., consult. engrs. W. Stegman, City Hall, city engr.

Wis., Neenah—City, E. A. Kalfahs, mayor, 208 S. Commercial St., plans completed bridge across Fox River, Oak to First St., $300,000. Land rights not cleared. C. E. Kirch, State Office Bldg., Madison, state bridge engr. A. G. Prunuske, City Hall, city engr.

Wis., Waukesha—City, City Hall, plans under way bridges. $75,000. Financing not provided. W. E. Dick, City Hall, city engr.

READY FOR BIDS

Neb., Lincoln—Lancaster Co., Lincoln, plans completed six 150 ft. steel, concrete girder bridges. L. W. Weaver, Lincoln, co. engr.

O., Akron—Summit Co., Akron, plans completed 11 concrete, steel bridges. $330,000. A. C. Ranney, Akron, co. engr. CD 11/24/43—ENR 12/2/43

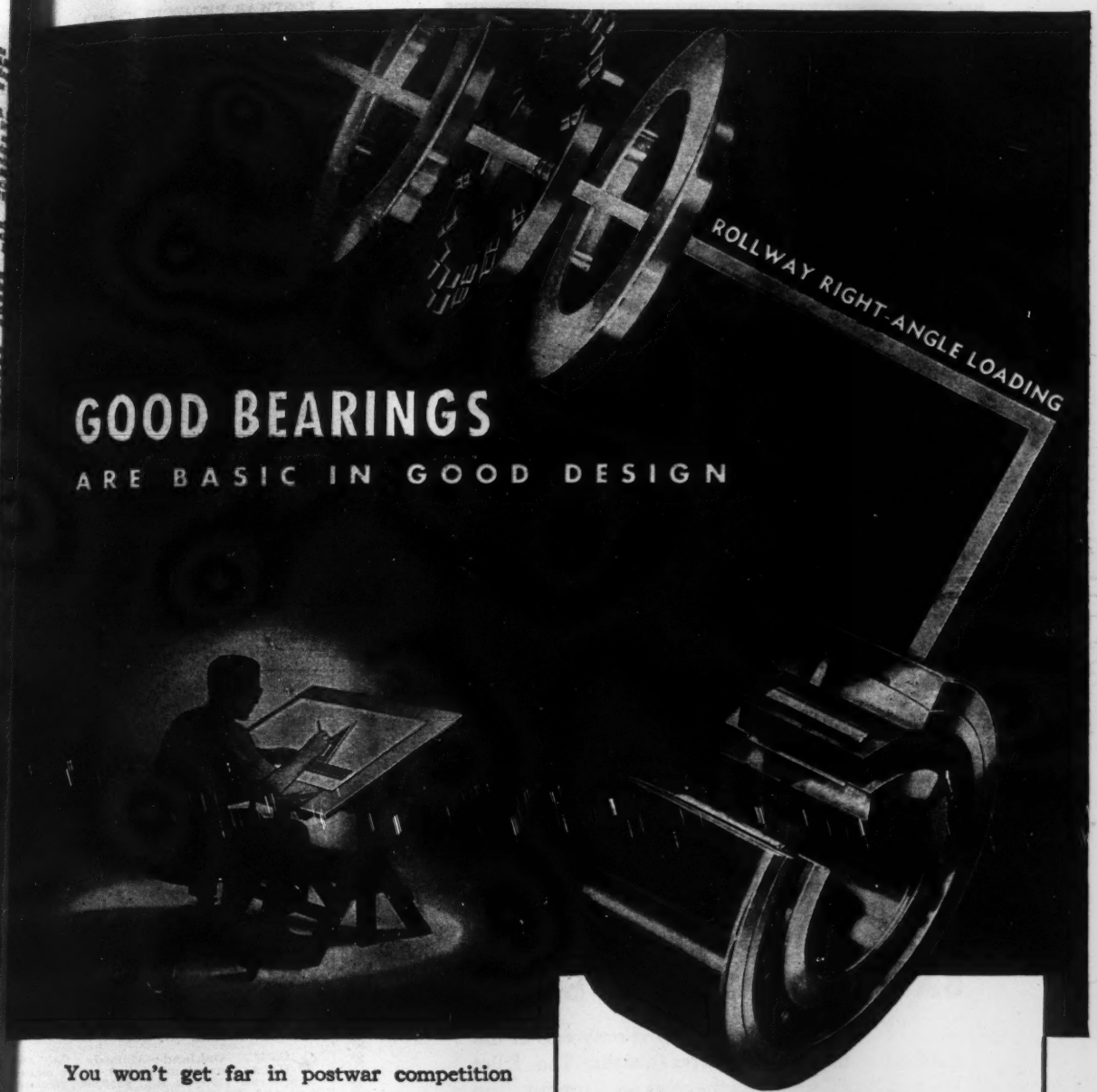
STREETS AND ROADS

PROPOSED WORK

Calif., Monterey—City, City Hall, paving Scott St., Scott St. exten., Tyler and Washington, $25,300; Wave St., $41,300; Hermann Drive and Via Del Rey, $30,400; Figueroa St., $25,100; Oak Grove St., $50,000; Alvarado exten., $12,000; Camino El Estero, $22,100; Franklin St., $9,200; Irving St., $6,000; David Ave., Lighthouse to Cannery Row, $6,300; Pierce St., $10,000; Dutra St., $6,500; Cortez St., $15,000; Anthony St., $9,600; Webster St., $7,200; Adams St., $8,900; Munras Ave., $12,000; widening, paving Lighthouse Ave., $57,400; Hartnell and Cass Sts., $40,700.

★**Calif., San Jose**—Santa Clara Co., Court House, Edmundson Ave., $45,000; Bloomfield Ave., $100,000; Uvas Rd., $170,000; Leavesley Rd., Ferguson Rd., $110,000; McKean Rd., $45,000; Phelan Ave., $25,000; Story Rd., $70,000; Alma Ave., Almaden Rd., $30,000; McLaughlin Ave., $60,000; Alum Rock Ave., $25,000; Calaveras Rd., $30,000; N. 4 St., $40,000; San Jose-Alviso Rd., $100,000; McKee Rd. Imprvt., San Jose city limits to Alum Rock Ave., $72,000; White Rd., north side Alum Rock Ave. to McKeirnan Creek, $40,000; Santa Clara-Alviso Rd. (Santa Clara to Bayshore Highway), $27,000; Santa Clara-Alviso Rd. (Agnew to Mt. View-Alviso Rd.), $30,000; Downer Ave., $105,000; Almaden Rd. (Redmond to McKean Rds.), $50,000; McKean Rd. (Almaden to Calero Rds.), $75,000; Stevens Creek Rd. (Saratoga Ave. to Cupertino), $125,000; Lawrence Station Rd., $150,000; Hamilton Ave. (State highway to Hicks Rd.), $35,000; Santa Clara-Los Gatos Rd. (Santa Clara to Hamilton Ave.), $30,000; Santa Clara-Los Gatos Rd. $100,000; Junipero Serra Blvd., $100,000; Homestead and Grand Rds., $80,000; San Antonio Ave. (101 Highway to Bayshore Highway), $40,000; San Jose-Stevens Creek Rd., $25,000; Camden Rd., $40,000; Middlefield Rd., $60,000; Stierlin Rd., $25,000; Blossom Hill Rd., $60,000; exten. Campbell Ave. (San Tomas Aquino Rd. to Saratoga Ave.), $30,000; Evelyn Ave. (Mt. View to Sunnyvale), $60,000; Alma St. (Palo Alto to Mt. View), $80,000. CD 4/27. 9/8—ENR 5/18, 9/21.

★**O., Akron**—Summit Co., Akron, paving 120 mi. highways. $850,000. CD 11/24/43—ENR 12/2/43.



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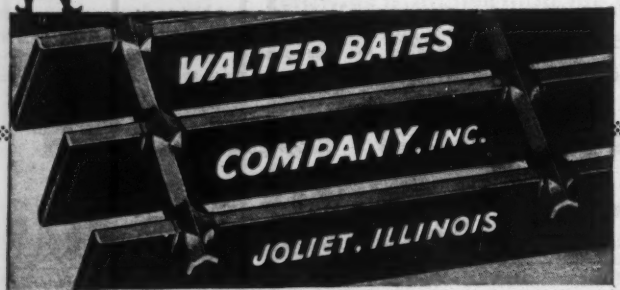


POSTWAR PROJECTS (Cont'd.)

★**O., Dayton**—Montgome[ry] Co., Co[unty] House, circumferential h[ighw]ays, 2 no[rth] and south and 2 east and [w]est, $3,000,[000]; county highway widening, [re]surfacing a[nd] drainage, $1,500,000; count[y] highway o[ver] highway grade separations [(3)], $3,000,[000]. Financing not provided.

Tex., Gatesville—Coryell [Co.], Gatesvil[le] roads imprvs. $100,000. [Land] rights [to be] cleared, financing not provid[ed].

★**Tex., Jasper**—Jasper Co.; A. Turn[er] judge, Jasper, approx. 2[8] mi. gradin[g], drainage structures, flexible base with a[s]phalt surface, $3,000,000. Financing [not] provided.

Washington—State Hy. Dpt., C. Hicke[y] dir., Olympia, paving highway from Wash[-] ington State College stadium to city limits at Pullman, Whitman Co., $130,000; reconstructing Primary State Hy. 5, Auburn to Enumclaw, King Co., $225,000. Financing not provided.

Washington—State Hy. Dpt., C. Hicke[y] Olympia, dir., Olympia, exten. Primary State Hy. 3, from Grand Ronde River to Wash[-] ington-Oregon state line, Asotin Co. $300,[000]. Financing not provided.

PLANS UNDER WAY

★**California**—Alameda Co., Court Hous[e] Oakland, City of Oakland and State Hy. Dpt., Sacramento, constructing Mountain Blvd. route. $3,500,000. W. B. Boggs, Court House, Oakland, civil engr. and co. surv.

★**Calif., Alameda**—City, City Hall, reconstructing Encinal Ave., from Oak to Sherman Sts., $91,300; Fernside Blvd. from Encinal to Versailles Aves., $87,200; Versailles Ave. from Bridge St. to Otis Drive, $59,600; Park St. from Encinal Ave. to Otis Drive, $26,300; Buena Vista Ave. from Webster to Park Sts. and from Park St. to Versailles Ave., $102,800; Pacific Ave. from Webster to Main Sts., $70,400; San Antonio Ave. from 9 to Morton Sts., $21,000; San Jose Ave. and one block of Morton St., from San Antonio Ave. to High St., $88,400; Central Ave. from High to Main Sts., $70,[2]50; Otis Drive from Park St. to Bway., $15,[3]00; Fernside Blvd. exten. from Encinal Ave. to Otis Drive, $187,400; Lincoln Ave. from [P]ark to Park Sts., $207,000; constructing Lincoln Ave. exten. from Park St. to Versailles Bridge, $55,000; Lincoln Ave. over railroad right-of-way, $45,000. C. Froerer, City Hall, city engr. CD 11/17—ENR 11/30.

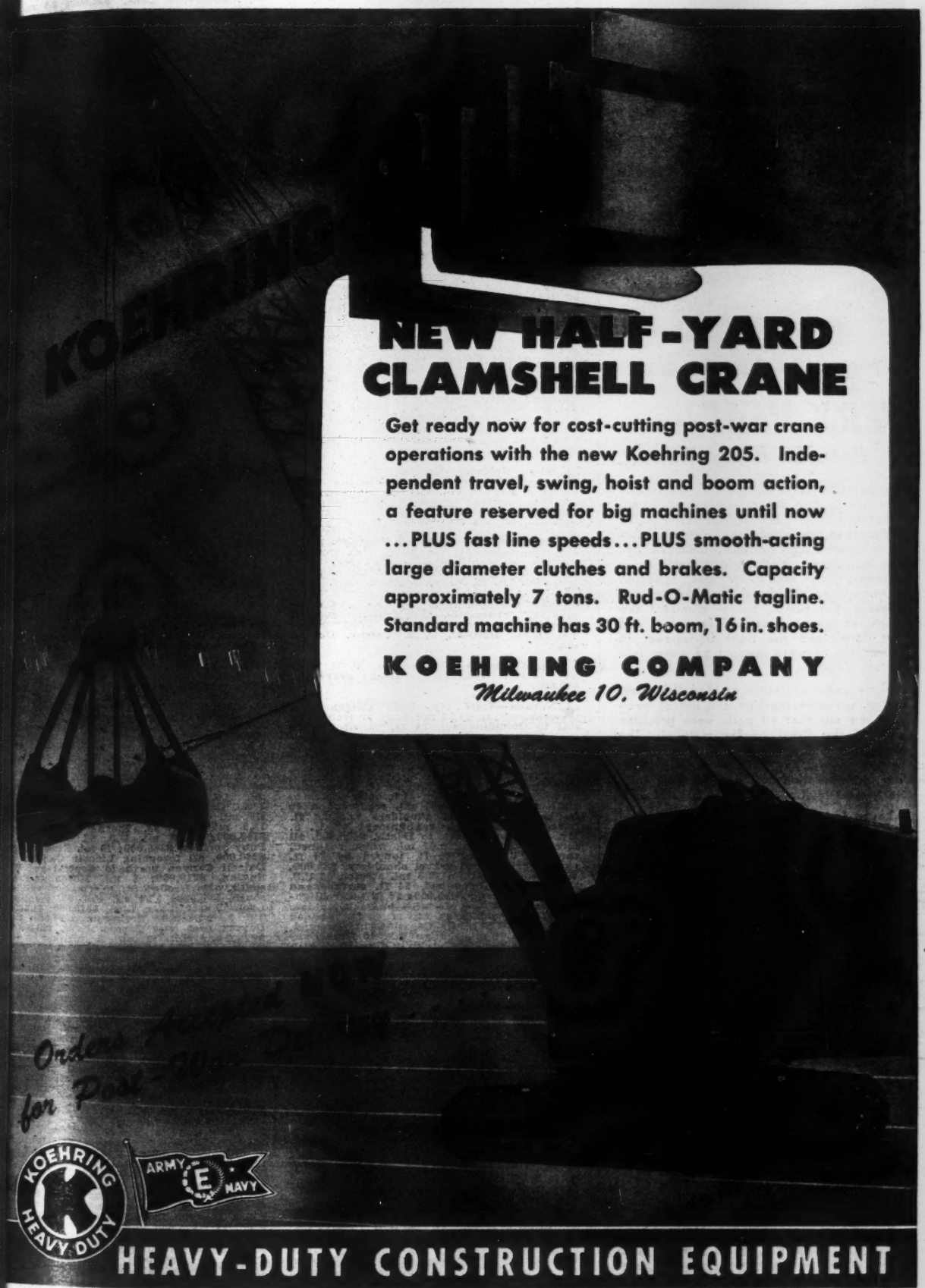
★**Calif., Berkeley**—City, City Hall, widening, paving 7 St., Heinz to Dwight Way and 6 St. from Dwight Way to No. city line, $215,000; portions Sacramento St. throughout its entire length to Hopkins St., $300,[000]; exten. Domingo Ave. southerly from Plaza to Parkside Drs., $22,000; Sacramento St. connecting with proposed project in Oakland; opening, widening, paving Cedar St. from Chestnut to Sacramento Sts., $25,000; constructing road on west side of S.P. tracks on Sutter St. eliminating dangerous railroad crossing, $35,000; paving Grizzly Peak Blvd., from Shasta Rd. southerly, $31,000; gutter fills throughout city, $60,000; installing concrete curbs, $75,000; repairing concrete walks, $50,000; widening Telegraph Ave., Dwight Way to Bancroft, $500,000; Bancroft Way, Fulton St. to College Ave., $137,000; opening, paving Gilman St., Hopkins to Sacramento Sts., $37,000; Ashby Ave. imprvs., incl. lighting, widening and traffic signals, $1,114,[000]; reconstructing culverts, $110,000. H. Goodridge, City Hall, city engr.

★**Calif., Oakland**—Alameda Co., Court House, realignment and bridge construction, Crow Canyon Rd., $350,000; reconstruction and drainage, Lake Shabot Rd., $56,000; Meedland Ave., $86,000; Tassajara Rd., $56,000; Tennyson Rd., $63,000; Lowry Rd., $36,000; reconstructing Redwood Rd., $41,000; Altamont Pass, $88,000; Central Ave., $78,000; Jarvis Rd., $87,000; Mowry Rd., $63,000; Santos Rd., $35,000; Landing Rd. connections to proposed East Shore Freeway, $57,000; San Leandro Blvd. exten., $51,000. W. B. Boggs, Court House, co. surveyor and civil engr. CD 1/7/44—ENR 1/27/44.

★**Calif., Sacramento**—City, City Hall, plans under way reconstructing Eastern Ave., 57 to 65 Sts., $54,000; 65 St. (Eastern Ave. to 14 St.), $54,000; [5] St. I to Bway., $88,000; widening Bway., 5 to 16 Sts., $128,000; constructing 5 St., Bway. to Riverside, $36,000; reconstructing sidewalks in business district, $200,000. F. Klaus, City Hall, city engr. CD 2/3/44—ENR 2/24/44.

Calif., Sacramento—Sacramento Co., Court House, imprv. 3.5 mi. Howe Ave. Rd., $128,-180; 2.5 mi. Michigan Bar-Ione Rd. $167,000; Arno Rd. between Stockton Blvd. and Alta Mesa Rd. and bridge, $11,700; constructing 2 mi. Elk Grove-Florin Rd., $37,200. A. Kiefer, Court House, acting co. engr. CD 10/18/43—ENR 10/21/43.

Calif., San Bruno—City, City Hall, widening, exten. ½ mi., Herman Ave. from Euclid Ave. to north city limits, and widening San Bruno Ave. from San Mateo Ave. to Easterly limits, $52,000. C. L. White, City Hall, city engr.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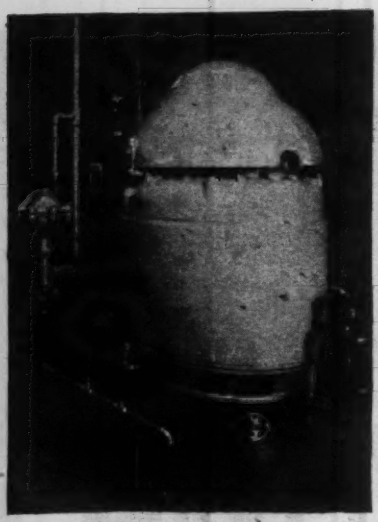

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LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

POSTWAR PROJECTS (Cont'd.)

★**Ill., Chicago**—City, City Hall, preliminary plans completed Super-highway, Northwest Route, from Halsted St. and Chicago Ave. along railroad right of way with terminal at Northwest Hy. and Bryn Mawr and connection to Edens Parkway and U. S. 41, **$56,332,000**; Illinois and Michigan Canal from Halsted and 26 Sts. to abandoned canal's right of way at Damen along canal route to connect with U.S. 66, west of Summit, **$22,556,300**; Southwest Route from Halsted and 26 Sts. to 87 St. with branch near 60 St. paralleling railroad yards to Indianapolis Ave. and state line, **$59,237,500**. Financing not provided. CD 3/4/43—ENR 3/11/43 under Illinois.

★**Ill., Rock Island**—City Public Wks. Dpt., City Hall, super highway from Mill St. to Moline, **$2,000,000**; paving, **$1,800,000**; concrete repaving downtown section, **$1,000,000**; sidewalks, **$800,000**. W. J. Gallagher, City Hall, city engr.

★**Ill., Rock Island**—Rock Island Co., M. J. Norby, supt. hys., Court House, plans 75% completed 15 mi. concrete paving, **$707,000**; plans 60% completed 65 mi. crushed stone or gravel secondary roads, **$500,000**.

Mich., Detroit—City Dpt. P. Wks., City Hall, plans under way paving 1,220 ft. Ardmore Ave., Vassar to Pembroke Sts., **$18,300**; 410 ft. Brentwood Ave. near Packard St., **$6,150**; 455 ft. Driggs St., Cavalry to Campbell Sts., **$6,825**; 2,575 ft. Goulburn Ave., 7 mile to State Fair Ave., **$40,525**; 1,205 ft. Neff Rd., Mack Ave. north, **$18,075**; 524 ft. Rutherford Ave., Outer Drive to Thatcher St., **$7,860**; 801 ft. Terry St., Belton to McKenzie Sts., **$12,015**; 588 ft. Washburn Ave., Curtis to Pickford Aves., **$8,820**. G. P. Thompson, City Hall, city engr. CD 3/30/43—ENR 4/1/43.

★**Miss., Gulfport**—Harrison Co., Gulfport, plans 10% completed constructing roads, culverts, bituminous concrete, soil stabilization with surface treatment, **$2,847,934**. Financing not provided. Geo. R. Boddie, P. O. Box 608, co. engr.

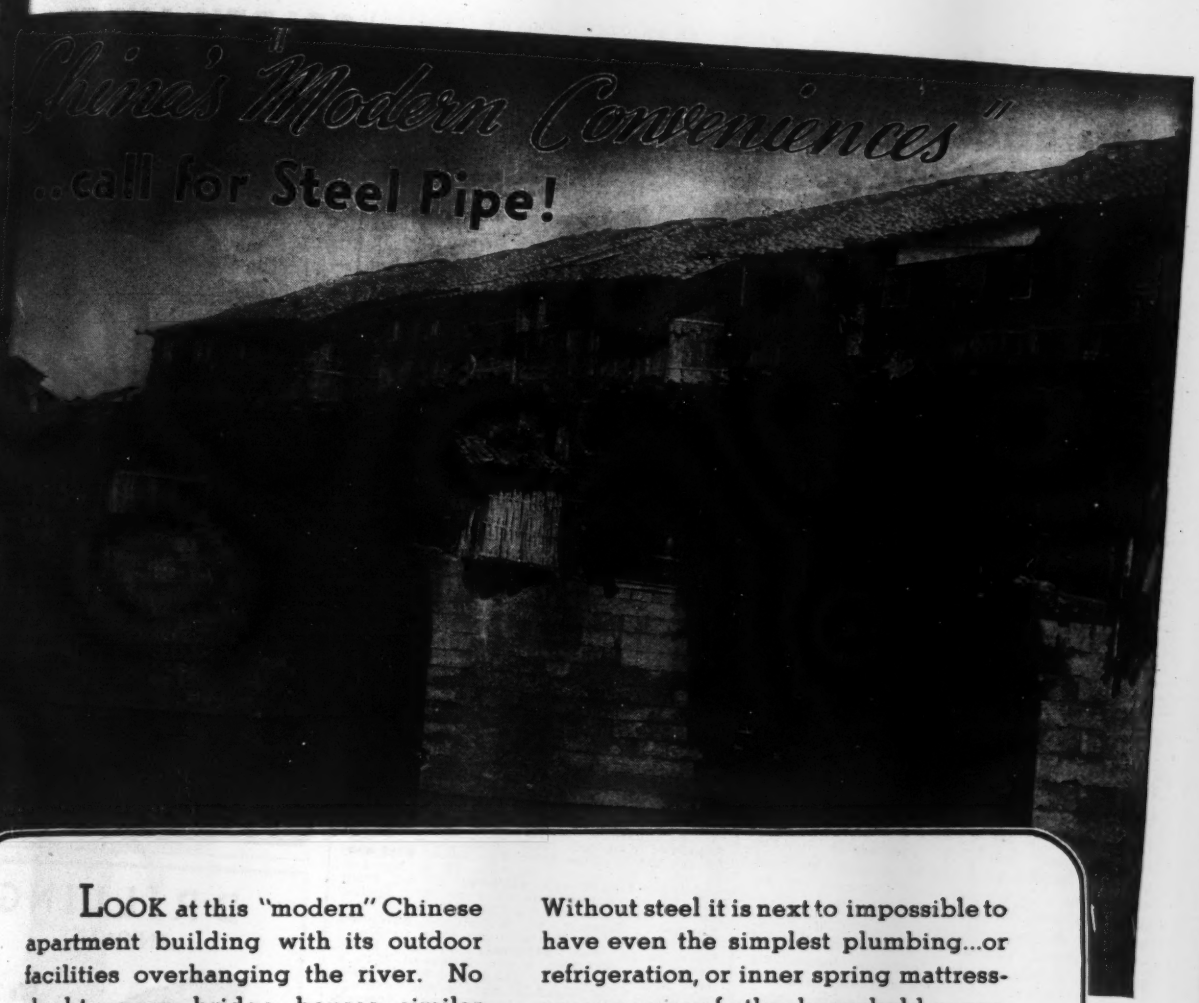
Neb., Beatrice—Gage Co., Beatrice, plans 50% completed 1½ in. bituminous wearing surface on waterbound crushed rock paving 21 mi. road. **$294,000**. Financing not provided. R. H. Eddy, Beatrice, engr.

Neb., Gering—Scotts Bluff Co., Gering, grading, graveling new roads, repairs, straightening present steel, wood bridge structures. **$150,000**. O. S. Cooper, Gering, engr.

Neb., Lexington—Dawson Co., F. E. Tanner, surv., Lexington, road graveling. **$30,000**.

★**Nevada**—State Hy. Dpt., Carson City, constructing 14.53 mi. U. S. 91 from Crystal to Glendale incl. 24 ft. paved surface with gravel shoulders on top of 40 ft. roadbed, Clark Co., **$720,000**; 2 mi. 4-lane roadway with gutters and sidewalks from west city limits of Elko through to east on U.S. 40, **$225,000**; 3.92 mi. U.S. 40 on 40 ft. bed with gravel shoulders and 24 ft. paved surface from north fork of Humboldt River to Halleck, **$111,100**; 10.07 mi., roadway on 40 ft. bed with gravel shoulders and 24 ft. paved surface, incl. realignment on U. S. Hy. 40, from Halleck to Deeth, **$475,000**, all foregoing Elko Co.; 0.67 mi. widen roadbed, through Verdi to 40 ft. topped by 24 ft. paved surface and gravel shoulders, **$80,000**, Washoe Co.; realign 13.5 mi. stretch of U.S. 95 with 40 ft. roadbed, 24 ft. surface and gravel shoulders, **$625,000**; 26.72 mi. realignment span of U.S. 40 with gravel shoulders and 24 ft. surface on top of 40 ft. roadbed from Lyon-Churchill Co. line to Fanning, **$410,000**; 1.01 mi. realign U.S. 40 from Fanning to Churchill-Pershing Co. line with gravel shoulders and 24 ft. surface on top of 40 ft. roadbed, **$70,000**, all foregoing Churchill Co. R. A. Allen, Carson City, state hy. engr. CD 5/24—ENR 6/1.

★**Nevada**—State, c/o State Planning Bd., Carson City, imprv. 13.5 mi. U.S. 95, from 13.5 mi. south of Fallon to Fallon, **$432,000**; 7.5 mi. roads in Scheckler District, **$113,000**; 1.5 mi. from S.R. 42, 0.7 mi. west of Stillwater, north to Ranches, **$18,000**; 1 mi. from S.R. 42, 4 mi. east of Fallon, north to school, **$12,000**; 2.4 mi. from U.S. 50 north through Swingle Bench to U.S. 95, **$29,000**; 1 mi. exten. Whitney Lane easterly 1 mi., **$10,000**; 6.7 mi. from U.S. 95, 8 mi. south of Fallon, east and north to U.S. 50, **$80,000**; 1.2 mi. from U.S. 95, 5 mi. south of Fallon, east to U.S. 50, **$15,000**; 1.4 mi. easterly exten. in Old River District, **$17,000**; 2 mi. from U.S. 50, 3 mi. south of Fallon, east and south, **$24,000**; 1.48 mi. U.S. 95, Lyon-Churchill Co. line to Hazen, **$60,000**; 10.06 mi. U.S. 50, Fallon to Grimes, **$201,000**; 5 mi. Fallon to 5 mi. east, **$50,000**; 2 mi. from U.S. 95 to 1 mi. east of U.S. 50, 2 mi. south of Fallon, **$24,000**; 10 mi. S.R. 1A from 2 mi. north of Fallon, **$150,000**; 10.18 mi. U.S. 50, Westgate to Eastgate, **$265,000**; 22.4 mi. 12 mi. north of Fallon to Fanning (U.S. 40), **$403,000**, all foregoing Churchill Co.; 1 mi. U.S. 395 to airport, **$15,000**; 3.1 mi. Walley Lane, **$25,000**; 2.6 mi. Centerville Lane, **$36,000**; 0.9 mi. Gardnerville Limits east 1 mi., **$14,000**; 5 mi. U.S. 395, Gradalbaugh to Douglas-Ormsby Co. line, **$212,000**; 16 mi. Ridge Diamond west towards Pahrump, **$187,000**; 3.2 mi. Waterloo Lane, **$50,000**; 6.3 mi. Foothill Rd. from west end Centerville Lane to Genoa, **$85,000**; 2.98 mi. U.S. 50, Spooner to Douglas-Ormsby Co. Line, **$119,000**; 6 mi. Foothill Rd. from Genoa northeast to U.S. 395, **$78,000**; 5.5 mi. Foothill Rd. from Centerville Lane southeast to S.R. 1, **$86,000**, all foregoing Douglas Co.; 12.99 mi. U.S. 40 north Fork Humboldt River to Deeth, **$586,000**; 9.67 mi. U.S. 40, Wells to Moor, **$435,000**; 8.69 mi. U.S. 40, Moor to west foot of Pequops, **$285,000**; 4.6 mi. Elko to 5 mi. S.E., **$23,000**; 19 mi. 5 mi. southeast Elko to 3 mi. northeast of Lamoille, **$264,000**; 10 mi. Carlin south towards Pine Valley, **$120,000**; 26 mi. from Lamoille Rd. south via Jiggs to junction Harrison Pass Rd., **$312,000**; 6.26 mi. U.S. 40 west foot to east foot, Pequops, **$1,035,000**; 14.89 mi. U.S. 40 east foot Pequops to Silver Zone, **$470,000**; 16 mi. U.S. 50, White Pine-Elko County line to 16 mi. north, **$640,000**; 14.3 mi. U.S. 40, Silver Zone to Wendover, **$670,000**; 20.3 mi. Dinner Station west 7 mi. east of Tuscarora, **$366,000**; 22 mi. U.S. 40 to Montelle, **$230,000**; 13.4 mi. U.S. 50 from 16 mi. north of White Pine-Elko Co. line to Ferguson Springs, **$535,000**; 23.97 mi. U.S. 50, Ferguson Springs to Wendover, **$719,000**; 19 mi. from S.R. 1 7 mi. east of Tuscarora, north in Independence Valley, **$285,000**; 11.6 mi. Starr Valley Rd. **$139,000**; 6.4 mi. from west side Clover Valley to U.S. 93, **$96,000**; 4.2 mi. from Starr Valley Road southwest toward Lamoille, **$50,000**, all foregoing Elko Co.; 15 mi. U.S. 95 to Gold Point, **$120,000**; 6 mi. U.S. 95, Tonopah to 6½ mi. west, **$115,000**; 16.21 mi. U.S. 95, Goldfield to Millers Cut-Off Rd., **$405,000**; 30 mi. U.S. 6 to 5 mi. south of Dyer, **$210,000**; 9 mi. Scotty's Castle Rd., **$135,000**; 12 mi. from Junction Gold Point Road to Lida, **$84,000**, all foregoing Esmeralda Co.; 4.3 mi. U.S. 40, Lander-Eureka Co. line to Dunphy, **$175,000**; 0.5 mi. U.S. 40, Shoshone Overpass and approaches, **$45,000**; 9.08 mi. U.S. 40, Dunphy to 9 mi. east, **$560,000**; 1.5 mi. Pine Valley to Eureka-Elko Co. line, **$18,000** 20.2 mi. Eureka north to Gordon Pass, **$151,000**; 8 mi. U.S. 50 south to Fish Creek, **$96,000**; 3.4 mi. New York Canyon Rd., **$51,000**, all foregoing Eureka Co.; 8.6 mi. U.S. 40, east foot Golconda summit to Stonehouse, **$218,000**; 10 mi. Pinson Ranch to Getchell Mine Junction, **$150,000**; 14.1 mi. U.S. 95, west to Sod House, **$113,000**; 5.6 mi. Sod House to Quinn River Crossing, **$316,000**; 2 mi. U.S. 40 Realignment to Winnemucca east, **$125,000**; 31 mi. Quinn River crossing to Denio, **$372,000**, all foregoing Humboldt Co.; 19.5 mi. U.S. 40, Bastian Mountain to Lander-Eureka Co. line, **$620,000**; 27.9 mi. Austin to 28 mi. north, **$375,000**; 10.7 mi., 28 mi. to 39 mi. north of Austin, **$65,000**; 18.3 mi. U.S. 50 south via Smoky Valley to Lander-Nye Co. line, **$278,000**; 4.09 mi. U.S. 50, Austin Summit, **$200,000**, all foregoing Lander Co.; 20.93 mi. S.R. 25, Panaca to Nevada-Utah State Line, **$550,000**; 16.8 mi. Pioche to Ursine, **$202,000**; 9.56 mi. U.S. 93, Pony Springs to Dutch Johns, **$335,000**; 5 mi. U.S. 1 via Prince Mine to Castleton, **$90,000**; 6 mi. U.S. 93 to Cathedral Gorge, **$24,000**; 3 mi. Caliente to Ryan State Park, **$45,000**; 3.5 mi. Ryan Park Rd. to Etna, **$53,000**; 13.5 mi. U.S. 93, Pioche to Stonehouse, **$297,000**; 15.73 mi. U.S. 93 Stonehouse to Pony Springs, **$346,000**; 16 mi. Etna to Elgin, **$240,000**, all foregoing Lincoln Co.; 13.7 mi. Dalzell Canyon north to Central and Wellington, **$210,000**; 8 mi. Mason east and south, also Brodge St. (Yerington) east and south, **$96,000**; 9.24 mi. U.S. 95, Fernley to Lyon-Churchill Co. Line, **$310,000**; 11.74 mi. S.R. 3, Wilson to Yerington, **$294,000**; 1 mi. Dayton east over Carson River, **$25,000**; 1 mi. from S.R. 3 up E. Walker toward Wichman, **$224,000**; 3.43 mi. U.S. 40, Washington-Lyon Co. line to Fernley Overpass, **$163,000**; 0.17 mi. U.S. 40, Fernley Overpass, **$35,000**; 3.78 mi. U.S. 50, Moundhouse to Dayton, **$114,000**; 3.47 mi. S.R. 3, Wilson Canyon, **$140,000**; 14 mi. from 14 mi. up E. Walker to Wichman, **$224,000**; 16 mi. Weeks up Carson River to U.S. 50, **$240,000**, all foregoing Lyon Co.; 10 mi. Basalt towards Tonopah Junction via S.R. 10, **$150,000**; 11.5 mi. S.R. 10 from 10 mi. N.E. Basalt to Tonopah Junction, **$172,000**; 15 mi. S.R. 23 from Nye-Mineral to Mineral-Churchill Co. line, **$42,000**, all foregoing Mineral Co.; 17 mi. S.R. 8A from Round Mountain junction north towards U.S. 50, **$270,000**; 2.7 mi. S.R. 8A to Round Mountain, **$32,000**; 1.78 mi. U.S. 95 through Tonopah and to Nye-Esmeralda Co. line, **$90,000**; 15.9 mi. S.R. 8A from 18 mi. north of Round Mountain to Nye-Lander Co. line, **$270,000**; 12.5 mi. S.R. 16, from U.S. 95 south 12.5 mi., **$175,000**; 16 mi. from 12.5 mi. south U.S. 95 south to Pahrump, **$225,000**; 12 mi. Scotty's Castle Rd., **$180,000**; 10 mi. from Pahrump southeast to Nye-Clark Co. line, **$125,000**; 2 mi. Rhyolite to S.R. 58, **$25,000**, all foregoing Nye Co.; 2.5 mi. Carson City west up Kings Canyon Rd., **$60,000**; 3 mi. U.S. 395, Clear Creek to Carson City, **$90,000**; 2.4 mi. from S.R. 65 east of Prison, southeast to Carson River, **$36,000**; 0.5 mi. from S.R. 65 east of Prison



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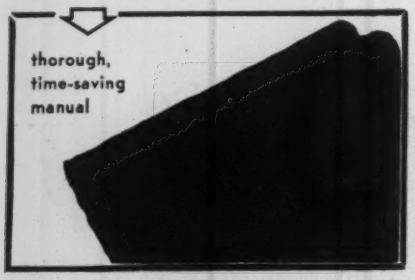

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POSTWAR PROJECTS (Cont'd.)

northeast to Ranches, **$8,000**; 2.5 mi. from U.S. 50 to Brunswick Canyon, **$40,000**; 7.33 mi. U. S. 50, Douglas-Ormsby Co. line to U.S. 395, **$293,000**; 2 mi. Ash Canyon Rd., **$29,000**; 0.7 mi. New Empire Rd., **$11,000**; 2 mi. from U.S. 395 to Carson Airport, **$25,000**, all foregoing Ormsby Co.; 11.59 mi. U.S. 40, Humboldt House to Mill City, **$392,000**; 12 mi. U.S. 40 south and east into Lower Valley, **$144,000**; 0.5 mi. Imlay to U.S. 40, **$8,000**; 4.2 mi. from U.S. 40, 1 mi. northeast of Lovelock N. and E., **$50,000**; 8.7 mi. Mill City to Nevada-Mass. Tungsten Mine, **$87,000**; 0.5 mi. from 2 mi. west of lovelock north to Cemetery, **$7,000**; 12 mi. from U.S. 40, near Oreano east to Spring Valley, **$216,000**; 6.13 mi. U.S. 40, Lovelock to Woolsey, **$161,000**; 14 mi. Spring Valley to Unionville, **$168,000**, all foregoing Pershing Co.; 3.9 mi. Virginia City via Gold Hill to Storey-Lyon Co. Line, Storey Co., **$25,000**; 4.8 mi. Franktown Lane, **$72,000**; 5.8 mi. E. 2 St. from Reno City limits to Vista, **$130,000**; 3.8 mi. Mayberrys via S. River Rd. to Reno, **$68,000**; 4.6 mi. Holcomb to Avansino Lanes, **$69,000**; 2.3 mi. S. Plumas St. and Moana Lane, **$46,000**; 2 mi. Plumb Lane, **$35,000**; 3.1 mi. Mill St. from Reno city limits to Glendale Lane, **$47,000**; 1.9 mi. Kletzke Lane, **$34,000**; 0.5 mi. Vassar St. from Reno city limits, to Kletzke Lane, **$10,000**; 7.84 mi. U.S. 395, Steamboat Springs to Reno, **$314,000**; 3.3 mi. Reno city limits to Wodeking Mine, **$59,000**; 3.3 mi. Vista North and west to East Sparks Limits, **$40,000**; 2.2 mi. from 0.5 mi. northeast of Sparks N.E., 2 mi., **$2.[illegible]0**; 2.7 mi. Frey Lane from Moana Lane to Avansino Lane, **$49,000**; 0.8 mi. Peckham Lane south to Home Gardens, **$10,000**; 2 mi. streets in Hill Subdivision west of Airport, **$36,000**; 5.1 mi. Glendale Lane from U.S. 395 to Glendale School, **$77,000**; 1.3 mi. Lakeside Dr., **$13,000**; 12 mi. Pyramid Lake Indian Reservation boundary north towards Gerlach, **$144,000**; U.S. 40, 4 St. in city of Reno, **$146,000**; 14 mi. north of Winnemucca Lake to Empire Mill, **$210,000**; 15.6 mi. Empire Mill to 10 mi. northwest of Gerlach, **$234,000**; 3.65 mi. U.S. 40, Cal-Nev. State Line to Verdi, **$110,000**; 2.54 mi. U.S. 40 Sparks to Vista, **$133,000**; 6.5 mi. U.S. 395, Washoe Summit to Steamboat, **$215,000**; 5.26 mi. U.S. 40, Vista to Hafed, **$273,000**; 8.23 mi. U.S. 40, Hafed to Clark, **$412,000**; 7.15 mi. U.S. 40, Clark to Derby, **$358,000**; 6.16 mi. U.S. 40, Derby to Washington-Lyon Co. line, **$308,000**, all foregoing Washoe Co.; 14.18 mi. U.S. 50, from 15 mi. north of Magnussons to junction of U.S. 93, **$355,000**; 6.09 mi. road from junction U.S. 93 to White Pine-Elko Co. Line, **$183,000**; 13 mi. from 12 mi. N. U.S. 50 in Newark Valley to Strawberry, **$130,000**; 17 mi. from U.S. 50 via Schell Lourne Pass into Spring Valley, **$213,000**; 15 mi. U.S. 50, West Foot Robinson Summit to Keystone, **$375,000**; 16.69 mi. U.S. 6, Sacramento Pass to Nev.-Utah state line, **$448,000**; 5.5 mi. Duck Creek Rd., **$88,000**; 3 mi. Ruth to U.S. 6 near Murray Summit, **$45,000**; 2.5 mi. Murray Summit to Ward Mountain Recreational Area, **$38,000**; 10 mi. Strawberry (Newark Valley), north to Ranches, **$100,000**; 3.9 mi. from 1.5 mi. south of Baker to U.S. 6, **$59,000**; 4 mi. Baker Rd. west to Forest Boundary, **$64,000**; 18 mi. Shoshone to U.S. 93, near Major Woods, **$216,000**; 12 mi. from U.S. 50 north via Newark Valley toward Strawberry, **$120,000**, all foregoing White Pine Co. R. A. Allen, state hy. engr. CD 5/24—ENR 6/1.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., plans under way constructing, reconstructing sea walls, at Welfare Island, Proj. HOS-1A; demolition 8 bldgs., HOS-9; repairing, rebuilding sea walls on North Brother Island, Proj. HOS-4A, for Dpt. Hospitals, 125 Worth St., New York, Zone 13. **$572,300.** State Aid Planning Funds allotted. Rose & Rose, 101 Park Ave., Zone 17, engr.

★**N. Y., New York**—President Bronx Boro, 851 Grand Concourse, plans completed imprv. Fordham Road from Webster Ave. to Southern Blvd., incl. underpass at Crotona Ave. and Southern Blvd. and realignment of Southern Blvd. from Fordham Rd. to Bedford Park Blvd., Proj. PX-38, **$2,765,000**, incl. land. Financing not provided. Madigan-Hyland, 28-04 41 St., Long Island City, consult. engrs. CD 10/20—ENR 11/2.

★**Ohio**—State Hy. Dpt., Columbus, plans under way 9 mi. U.S. Route 25, through Lima, Allen Co., **$6,000,000**; 12 mi. U.S. Route 25, from Franklin to Dayton, Butler and Montgomery Counties, **$5,460,000**; 8 mi. Newburgh Freeway on State Route 14, U.S. Route 21, through Cleveland, Cuyahoga Co., **$30,000,000**; 23 mi. Lakeland Freeway, on State Route 2, U.S. 21 from Cleveland to Painesville, Cuyahoga Co., **$15,000,000**; 16 mi. U.S. Route 40 through Columbus, Franklin Co., **$14,327,000**; 36 mi. U.S. Route 25, exten. from Cincinnati to Franklin, Hamilton and Butler Counties, **$21,630,000**; 16 mi. U.S. Route 25, Perrysburg to Toledo, Lucas Co., **$15,000,000**; 4 mi. U.S. Route 25, through Dayton, Montgomery Co., **$5,916,000**; 10 mi. U.S. Route 40, through Zanesville, Muskingum Co., **$3,500,000**; 14 mi. on U.S. Route 42, through Mansfield, Richland Co., **$5,000,000**; 11 mi. State Route 18, through Akron, Summit Co., **$17,700,000.** Legal obstacles to be overcome. CD 3/4/43—ENR 3/18/43.

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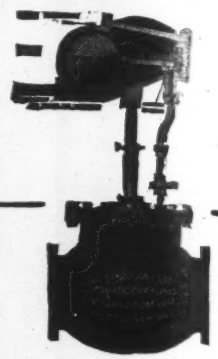

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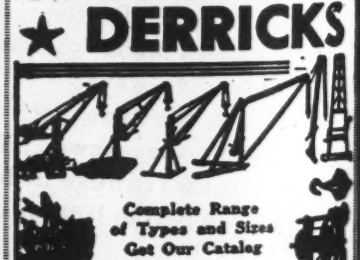

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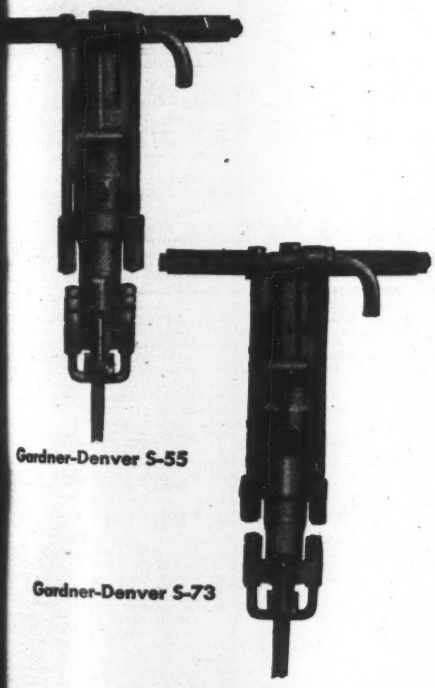

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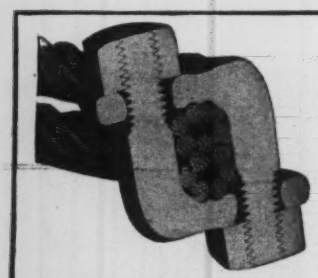

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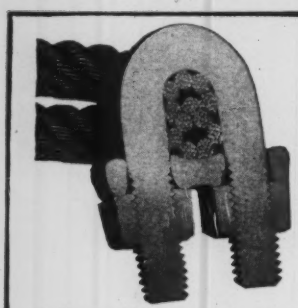

Ordinary U-bolts crush wires, frequently ruining rope ends. (Notice distorted hemp center under "U".)

(Nuts tightened to same tension with torque-indicating wrench in both cases)

"Fist-Grip" Clips protect your rope. 25% fewer can be used, because improved bearing surfaces deliver full rope power. They save time, too, because they go on faster — with any type wrench — and can't be put on backwards. They are the only clips with drop-forged bolts. Order test samples from your distributor today.

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POSTWAR PROJECTS (Cont'd.)

O., Coshocton—Comrs. Coshocton Co., Coshocton, bituminous surface treating 25 mi. county traffic bound gravel highways. **$125,000.** Financing not provided. K. H. Kinkley, co. engr. CD 11/12/43—ENR 11/18/43.

O., Jackson—Jackson Co. Eng. Dpt., Old Jail Bldg., plans reconstructing roads, bridges. **$90,000.** J. R. Turner, Jackson, co. engr.

O., Jackson—Jackson Co. Eng. Dpt., Old Jail Bldg., plans under way reconstructing roads, bridges. **$60,000.** J. R. Turner, Jackson, co. engr.

O., Lima—Comrs. Allen Co., Court House, plans 50% completed 60 mi. roads. **$300,000.** H. M. Mumaugh, Lima, co. engr. CD 11/12/43—ENR 11/18/43.

O., Port Clinton—Ottawa Co., Port Clinton, 1.68 mi. new 18 in. black top road construction in Harris Twp., **$30,000.** D. J. Nissen, Court House, Port Clinton, co. engr.

O., Troy—Miami Co., Court House, plans 25% completed imprv. numerous roads, bridges. **$100,000.** Land rights not cleared, financing not provided.

O., Wooster—Comrs. Wayne Co., Court House, plans 95% completed macadam resurfacing 17.088 mil., **$218,000;** plans 90% completed gravel resurfacing 300 mi. **$140,000;** plans 50% completed grade, drainage and structures, **$60,000.** Financing not provided. W. H. Metzler, Court House, co. engr. CD 11/24/43—ENR 12/2/43.

Pa., Scranton — City, City Hall, Zone 3, resurfacing, reconstructing paved streets, **$237,420.** Financing not provided. Bureau of Engineering, G. H. Wilson, City Hall, Zone 3, engr.

S. D., Sioux Falls—City, City Hall, curbing, guttering various streets, **$40,000.** R. E. Bragstad, City Hall, city engr.

Tenn., Trenton—Gibson Co. Highway Comn., Trenton, plans 20% completed grading, drainage, gravel and asphalt surfacing, timber bridge and concrete culverts and pipe, **$300,000,** Financing not provided. V. Wyatt, Box 86, co. engr.

Tex., Brownwood—City, City Hall, 90 blocks asphalt paving, **$135,000.** Financing not provided. C. W. McClelland, 1209 Durham St., city engr. CD 4/21/44—ENR 5/4/44.

Tex., Marshall—Harrison Co., Marshall, imprv. roads. **$135,000.** W. J. Warren, Box 168, Marshall, co. engr.

Wash., Cathlamet—Wahkiakum Co. Road Dpt., Cathlamet, plans under way roads and bridges. **$240,000.** Financing provided. C. L. Plymale, Box 97, co. engr.

Wash., Ellensburg—Kittitas Co., Ellensburg, plans 20% completed roads. **$100,000.** Financing provided. S. J. Dumbolton, Ellensburg, engr.

★**Wash., Everett**—Snohomish Co., Court House, plans completed, new construction and regrading 15 mi. various localities throughout county, **$216,500;** placing 2½- to 3-in. roadmix type of bituminous surfacing 107 mi. for 20 ft. width, **$476,000.** Financing not provided. R. Crane, Court House, co. engr. CD 9/18—ENR 10/5.

★**Wash., Port Angeles**—Clallam Co., constructing 12 mi. Neah Bay, Ozette Lake, **$84,000;** 15 mi. Lake Pleasant to Royal, **$75,000;** 6 mi. Swan Bay to Dupiess, **$30,000;** 10 mi. Royal to Neah Bay Junction, **$75,000;** 6 mi. Pysht Road junction to Clallam, **$18,000;** 11 mi. Dickie River to Dickie Lake, **$66,000;** 10½ mi. Heart O'Hills to Elwha River, **$25,000;** 4 mi. streets in Fogerty and Dolan and Puget Sound Colony, **$20,000;** 5 mi. Deer Park Rd., **$25,000;** 14 mi. Diamond Point Rd., **$84,000;** 1½ mi. Cat Lake Rd., **$6,000;** 5 bridges Neah Bay Hoko River, **$5,000;** Piedmont Rd., 2 bridge-culvert and fill, **$7,500.** H. Ahlvers, Port Angeles, co. road engr.

Wash., Raymond—Pacific Co., South Bend, clear, grub, grade, drain, surface 1.5 mi. road. **$25,000.** R. E. Woodward, South Bend, co. road engr.

Wash., South Bend—Pacific Co., South Bend, plans 75% completed light bituminous surface treatment 20 mi. roads, 18 ft. wide. **$30,000.** R. E. Woodward, South Bend, co. road engr.

★**W. Va., South Charleston**—Town, crushed rock or gravel with cement bound macadam streets and roads, concrete curbs and gutters; 3 rein.-con. bridges; 4 rein.-con railroad underpasses; river bank imprvs., rip-rap construction, **$2,104,000.** Land rights not cleared, legal obstacles to be overcome and financing not provided. M. C. Catlette, City Hall, engr.

W. Va., Wheeling—City, City Hall, plans 50% completed bituminous asphalt concrete on old stone base, brick and concrete street resurfacing and surface sealing with tar and chips approx. 14 mi. **$150,000.** Financing not provided. E. M. Howard, asst. city engr.

Wis., Neenah—City, 208 S. Commercial St., plans 20% completed paving, curbing, guttering, grading and surfacing, city wide, **$250,000.** A. G. Prunuske, City Hall, city engr.

★**Wis., Waukesha**—City, [illegible] Hall, plans under way grading, curbing, gutters, paving, sidewalks. **$1,360,000.** Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waupun—State Dept. Public Welfare, Madison, plans completed concrete curb work at Wisconsin State Prison, **$30,000.** Priorities refused. D. J. Mc[illegible]han, Madison, State Div. engr.

READY FOR BIDS

★**N. M., Roswell**—City, Thos. J. Hall, mayor, City Hall, plans completed permanent street paving, **$500,000.** Financing provided. Headman, Ferguson, Carollo & Classen, 412 Martin Bldg., El Paso, Tex., consult. engrs. L. Rowland, City Hall, city engr.

O., Akron—Summit Co., Akron, plans completed 20 mi. highway, **$750,000.** A. [illegible] Ranney, Akron, co. engr.

Wash., South Bend—Pacific Co., South Bend, plans completed clearing, grubbing, grading, draining, surfacing 1.2 mi. roadway 24 ft. wide. **$25,000.** R. E. Woodward, South Bend, co. engr.

CONTRACTS AWARDED

Neb., Lincoln — Lancaster Co., Lincoln, grading 75 mi. farm to market roads, own forces, **$75,000.** L. W. Weaver, Lincoln, co. engr.

★**Vt., Burlington**—City, City Hall, streets and roads, consisting grading, soil stabilization, surface treatment, low cost bituminous macadam, hot and cold plant-mix asphalt, pouring cement concrete and sidewalks, concrete integral curbing and gutters; bridges, consisting of small concrete culverts, own forces, **$823,000.** G. C. Stanley, City Hall, city engr. CD 8/25—ENR 9/7.

EARTHWORK, WATERWAYS

PROPOSED WORK

Mass., Whitman—Town, Bd. Selectmen, Town Hall, concrete dam at Hardings Pond, Pine St. To exceed **$25,000.** Financing not provided.

Ore., Medford—City, City Hall, flood control, **$50,000.** Financing not provided.

R. I., Newport—City, M. Easton, comr. Pub. Wks., City Hall, concrete sea walls at [illegible] locations. To exceed **$25,000.** Financing not provided.

Tex., Jasper—Jasper Co., A. Turner, judge, Jasper, 60 mi. drainage ditches. **$50,000.** Financing not provided.

PLANS UNDER WAY

Calif., Alameda—City, City Hall, reconstructing Bay Farm Island levee, **$130,000;** repairing seawalls on south shore, **$30,000.** C. Froerer, City Hall, city engr. CD 11/17—ENR 11/30, under Unclassified.

★**Ill., Rock Island**—City, City Hall, seawall, **$4,000,000.** W. J. Gallagher, City Hall, city engr.

★**Nevada**—State, c/o State Planning Comm., Carson City, imprvs. West Walker River, incl. 1400 acre reservoir at Pickle Meadows near Bridgeport, Mono Co., Calif., dam for diversion on Little Walker, 1000 c.f.s. canal therefrom to the Pickle Meadows Reservoir, 2 hydro-electric plants, one at Chris Flat just below reservoir and other in Antelope Valley to which water would be conducted by pressure pipeline, **$5,065,000;** imprv. Humboldt River (originating in Elko Co. and terminating in Pershing Co.), incl. constructing North Fork Reservoir, capacity 85,[illegible] acre-ft. to 90 ft. contour, constructing 4 regulatory steel-concrete dams in river to replace present unsatisfactory structures, stream channel imprvs., constructing South Fork Reservoir, capacity 60,900 acre-ft., **$3,522,000;** imprv. Muddy and tributaries, incl. constructing dam at White Narrows (Clark Co.), to create reservoir about 7,[illegible] acre-ft. capacity, constructing dam at Double Canyon for flood control and silt collection, Pine Canyon Dam, 45 ft. high having crest length of about 220 ft., Mathew Canyon Dam, 55 ft. high with crest length of 1[illegible] ft., enlarging channel in vicinity of Callente, Lincoln Co., Delmues Dam, 50 ft. high, and rerouting U. P. railroad, **$1,032,000;** imprv. Little Humboldt River and tributaries (Humboldt Co.), incl. flood control reservoir on Martin Creek, stream channel imprvs. consisting cleaning and eliminating curves and constructing 25 regulatory diversion dams, **$177,100;** imprv. Truckee and Carson Rivers (originates at Lake Tahoe, Calif., and discharges into Pyramids Lake, Washoe Co., incl. enlarging channel of Truckee River at places between Lake Tahoe and Donner Creek, use of 20,000 acre-ft. in Boca Reservoir on Little Truckee River for flood control, diversion canal of 1800 second-ft. capacity from river to north side above Fleish, thence by canal and tunnel to Washoe Valley, lying between Reno and Carson City, constructing Washoe Valley Reservoir, 1,[illegible]-000 acre-ft. capacity, power plant at Steamboat Springs to be operated from water from enlarged Washoe Lake on its return to Truckee River, river imprvs. in Truckee

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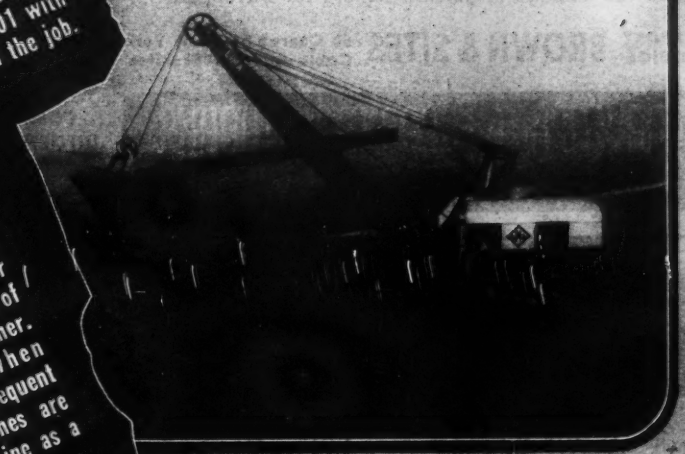

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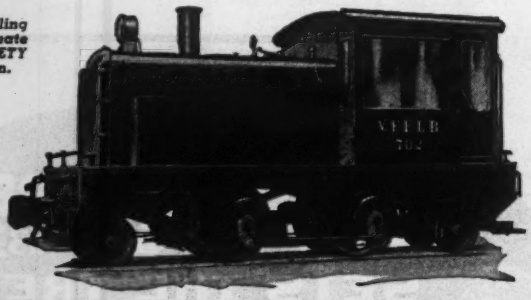

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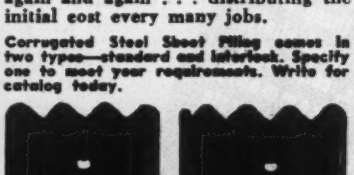

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POSTWAR PROJECTS (Cont'd.)

Meadows by lowering channel at outlet from Valley, enlarging impry. Derby Canal, Wataaheamu Reservoir on East Carson River, capacity 45,000 acre-ft. for flood control and better irrigation, $12,200,000. R. A. Allen, state hy. engr., chn. coma. and A. Merritt Smith, state engr. c. comn., both Carson City. CD 12/17/43—ENR.

Wis., Neenah—City, 301 S. Commercial St., plans soon under way narrowing slough, retaining walls, etc. $100,000. Land rights not cleared, financing not provided. A. G. Prunuske, City Hall, city engr.

★**Ont., London** — Thames Valley Flood Comn., composed of representatives of municipalities through which Thames River and tributaries flow, plans under way flood control and conservation projects in Thames River watershed. $9,000,000. W. Raymond Smith, Middlesex Co., London, engr. CD 8/26/43—ENR 9/2/43.

READY FOR BIDS

O., Akron—Summit Co., Akron, plans completed relocating Little Cuyahoga Channel, $175,000. A. F. Ranney, Akron, co. engr. CD 11/24/43—ENR 12/2/43.

PUBLIC BUILDINGS

PROPOSED WORK

Ark., Little Rock—State, State Office Bldg., office bldg., on capitol grounds, $375,000.

★**Calif., Berkeley**—Berkeley Bd. Educ., Walnut and Rose Sts., plans 4 schools for Berkeley High School, $750,000; 5 schools replacing old structures (Columbus and Franklin Elementary and McKinley Continuation High), $250,000 each; LeConte and Washington Schools, $240,000 each; school addns at Cragmont, $75,000; Jefferson $100,000; Thousand Oaks, $10,000; Burbank, $125,000; Garfield, $250,000; Willard, $100,000 plus $30,000 for grounds.

Calif., Hollister—San Benito Co., Court House, jail, $100,000; tuberculosis ward at County Hospital, $40,000; juvenile detention home on court house property, $20,000.

★**Calif., Long Beach** — Long Beach Bd. Educ., Long Beach, $8,500,000 bond election April 6, schools $1,948,558; Junior High Schools, $1,489,004; Senior High Schools, $2,239,270; City College, $1,501,316, etc.

Calif., Napa—Veterans Home of California, Napa, 3 story, rein.-con., 104-bed hospital addn.

★**Calif., Oakland**—Alameda Co., Court House, Fairmont Hospital, $2,000,000; detention home, $750,000; Court House Annex, $2,000,000; county jail, $500,000.

★**Calif., Oakland**—Oakland Bd. Educ. Administration Bldg., San Leandro High School, $825,000; Central-Merritt High School addn., $770,000 Castlemont High addn., $430,000; gymnasium at McClymonds High, $154,000; Lafayette School addn., $402,000.

Calif., Sacramento—Sacramento Co., Court House, library bldg. $175,000.

★**Calif., San Jose**—Santa Clara Co., Court House, county fair bldgs. and impvs. incl. poultry exhibit bldg., $30,000; cattle barns, $22,500; horse barns, $140,000; county hospital bldg., $13,000; fire station, police dpt. and first aid bldg., $25,000; exhibit bldg., $250,000; impry. race track, $10,000; landscaping, $15,000; grandstand, $150,000; horse show arena, $50,000; water tank, $14,500; administration bldg., $48,000; hook-up of Fairground sewer with city sewer, $75,000; playground and equip. for children, $20,000; dance hall and pavilion, $175,000; parking area, $76,500; underground electric sys. with transformer vault, $50,000; replacing transit water pipe with steel pipe, $25,000, etc. Total cost $1,225,000. CD 3/11/43—ENR 3/18/43.

★**Conn., Bristol**—City P. Wks. Dpt., City Hall, veterans club, incl. swimming pool, $500,000. Financing not provided.

Conn., Hebron—Town, W. S. Porter, First Selectman, Town Hall, school, athletic field and recreation house, Amston. $150,000. Financing not provided. Purchased 8 acre site.

Conn., Norwalk—City, C. G. Gregory, clk., City Hall, brick addn. to municipal garage, service facilities, $50,000. Financing not provided.

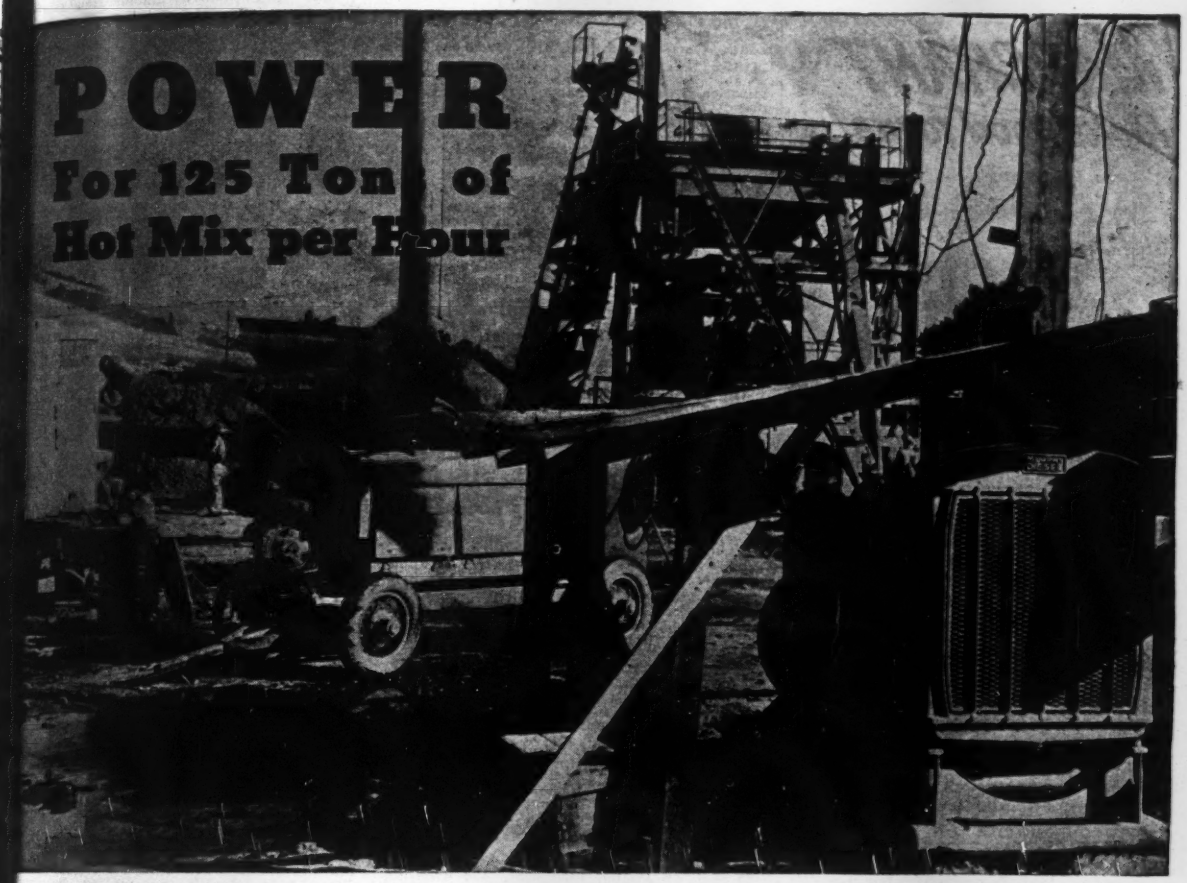
Conn., Norwalk—City, C. F. Gregory, clk., City Hall, brick, steel Junior High School addn. $250,000. Financing not provided.

Conn., South Windsor—Town, T. L. Burgess, first selectman, Town Hall, brick, steel school, $150,000. Land rights not cleared financing not provided.

Conn., Wilton—Town, Bd. Selectmen, Town Hall, brick, steel regional high school, $200,000. Financing not provided.

★**Ill., Charleston**—Eastern Illinois State Teachers' College, Charleston, Laboratory School, Proj. 2, $1,637,188; library, Proj. B-1, $815,648; power plant addn., Proj. 4 (part), $231,400; mechanical services exten., Proj. 4 (part), $112,000.

Ill., Chicago—State Military & Naval Dpt., Armory Bldg., Springfield, 184th Armory addn. Proj. 1, $200,000.



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POSTWAR PROJECTS (Cont'd.)

★**Ill., Chicago**—University of Chicago, 5750 S. Ellis St., Chicago, general hospital addn., (1st stage), Proj. 41. **$2,000,000.**

★**Ill., DeKalb**—Northern Illinois Teachers' College, DeKalb, men's and women's dormitories, Proj. B-2 (part), **$765,398**; power plant, utilities, Proj. B-3, **$430,624.** CD 2/17/44—ENR 3/9/44.

Ill., Dixon—State Dpt. Pub. Welfare, State Capitol Bldg., Springfield, two 50-bed childrens units, Proj. 24, **$268,000.**

★**Ill., Joliet**—State Dpt. Pub. Safety, Armory Bldg., Springfield, reconditioning east and west cell blocks, **$669,500**; main kitchen cold storage bldgs., and repairing inmates' dining room, **$77,250.**

★**Ill., Kankakee**—State Dpt. Pub. Welfare, State Capitol Bldg., Springfield, power plant, incl. equip., piping, utilities, facilities, Proj. 1, **$1,796,000.**

★**Ill., Macomb**—Western Illinois State Teachers College, science bldg. and greenhouse, Proj. 2, **$1,086,581**; women's dormitory and pool addn., Proj. 1, **$376,310**; power plant addn. and mechanical and electrical service addns., Proj. 4, **$520,000.**

Ill., Menard—State Dpt. Public Safety, Armory Bldg., Springfield, new inmates kitchen and dining room, Proj. 8, **$206,000**; new boiler a.c. generator, Proj. 6, **$206,000.**

★**Ill., Menard**—State Dpt. Pub. Safety, Armory Bldg., Springfield, reconditioning south cell house, **$334,750**; steam and hot water tunnels, piping, vacuum pumps and boiler water treatment, **$103,000**; underground electrical distr. sys., **$92,700**; altering prison walls, new guard tower, **$133,900**; separation of sanitary and storm sewers, **$206,000**, all at Menard Branch Penitentiary.

★**Ill., Normal**—State Dpt. Education & Registration, Capitol Bldg., Springfield, auditorium - music - speech - administration bldg., Proj. B-1, **$1,697,268**; new boiler and mechanical services, Proj. B-4, **$181,000.**

★**Ill., Pontiac**—State Dpt. Pub. Safety, Armory Bldg., Springfield, 50% bldg. program at farms, **$206,000**; bldg. for institutional departments, **$206,000**; laundry bldgs., equip., **$128,750**; concrete roads and walks, **$51,500**; tunnels and piping, **$123,000**; flood lighting sys., **$36,050**; administration bldg., **$360,500**; constructing 3 prison walls, guard towers, wagon lock and fire station, **$309,000**; 2 a.c. generators, switchboard, etc., **$206,000**; water storage, distribution, pump. facilities, **$77,250**; power house, equip., **$515,000**; sanitary and storm sewers, **$206,000**, all at Pontiac Branch Penitentiary.

★**Ill., Rock Island**—Housing Auth. of City of Rock Island, 1320 4 St., 150 dwelling units. Over **$500,000.**

★**Ill., Springfield**—Secy. of State, State Capitol Bldg., capitol bldg. rehabilitation, Proj. 8, **$90,750**; capitol group drives, walks, etc., Proj. 7, **$257,800**; capitol group pedestrian tunnels Proj. 6, **$154,500.**

★**Ill., Springfield**—State Military & Naval Dpts., State Armory Bldg., armory bldg. addns., Proj. 5, **$1,874,600**; Camp Lincoln addn., Proj. 2, **$618,000.**

★**Ill., Urbana**—State Dpt. Registration & Education, Capitol bldg., Springfield, Applied Research Laboratory addn. Proj. 1, **$165,377**; Natural Resources Bldg. addn, minor addns. to greenhouse and service bldg., small insecting unit, Proj. 1, **$1,946,000.**

Ill., Urbana—State Dpt. Registration & Education, Capitol Bldg., Springfield, water survey office bldg. and laboratory, **$386,250.**

★**Ill., Urbana**—University of Illinois, Urbana, health and physical education bldg., Proj. 29, **$2,360,000**; residence hall (1st stage), Proj. 17, **$1,500,000**; Betatren Laboratory, Proj. 10, **$1,700,000**; power plant addn., Priority 23, **$850,000**; electrical engineering bldg., Proj. 8, **$875,000**; health service station, Proj. 18, **$42,000**; veterinary bldg. (1st stage), Proj. 7, **$750,000**; band bldg., Proj 15 **$220,000**; library addn. (book stack unit), Proj. 16, **$315,000**; physics research laboratory (partial) **$200,000**; remodeling, modernizing existing bldgs. (1st stage), Proj. 28, **$500,000**; chemical engineering bldg., Proj. 1, **$615,000**; phone service exten. (1st stage) **$36,000.**

Ill., Zion—State Dpt. Military & Navy, Armory Bldg., Springfield, addns. to Camp Logan, Proj. 4, **$412,000.**

Me., Bristol—Town, Supt. Schools, Town Hall, rebuilding school. To exceed **$150,000.** Financing not provided.

Mass., Blackington—City of North Adams, Supt. of Schools, school in Blackington Dist. To exceed **$150,000.**

Mass., Leominster—City, Mayor La Pierre, City Hall, public library addn., 40 West St. To exceed **$150,000.** Financing not provided.

Mass., Swansea—Town, F. C. Chase, supt. Schools, Town Hall, gymnasium. To exceed **$150,000.** Financing not provided.

★**Mich., Lansing**—State Corrections Comn., State Office Bldg., plans prison. **$4,000,000.**

Minn., Grand Rapids — Itasca Co., R. J. Whaling, aud., court house, **$200,000.** ($70,000 available).

★**Mo., Maplewood-Richmond Heights (St. Louis, Zone 17, P. O.)**—Maplewood-Richmond Heights School Dist., E. R. Adams, supt., 7539 Manchester Ave., Maplewood, Zone 17, voted bonds for auditorium-gymnasiums, at Senior High School, 7349 Manchester Ave., Maplewood, and other at West Richmond School, 1313 Boland St., Richmond Heights, and general repairs to other schools in district. **$625,000** plus.

N. Y., Astoria—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Astoria Health Sub-Station, Proj. HL-27, for Dpt. Health, 125 Worth St., New York, Zone 7. **$150,000.**

★**N. Y. Brooklyn**—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general hospital, Proj. HO-61, **$3,500,000**; cancer bldg., Proj. HO-128 **$1,750,000**, and garage, Proj. HO-201 **$160,000**, both at Kings County Hospital, for Dpt. Hospitals, 125 Worth St., New York, Zone 13.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, reading room addn., Central Bldg., Proj. L-91, **$523,000**; Central Bldg. Bookstack addn., Proj. L-92, **$500,000**; Bensonhurst Branch, Proj. L-93, **$285,000**; East New York Branch, Proj. L-94, **$285,000**; Flatlands Branch, Proj. L-95, **$147,500**; Rugby Branch, Proj. L-96, **$150,000**; Bay Ridge Branch, Proj. L-79, **$180,000**; Kensington Branch, Proj. L-78, **$167,000**; Brighton Beach Branch, Proj. L-10, **$155,000**; Coney Island Branch, Proj. L-27, **$152,500**; Eastern Parkway Branch, Proj. L-32, **$350,000**; Tompkins Park Branch, Proj. L-33, **$232,500**; Canarsie Branch, Proj. L-29, **$135,500**; Crown Heights Branch, Proj. L-32, **$175,500**, all for Brooklyn Public Library; Grand Army Plaza, Zone 17.

N. Y., Corona—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, branch library, **$150,000.**

N. Y., Flushing—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Flushing Health Sub-Station A, Proj. HL-16, **$150,000**; Flushing Health Sub-Station B, Proj. HL-17, **$150,000**, for Dpt. Health, 125 Worth St., New York, Zone 7.

N. Y., Jamaica—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Jamaica East Health Sub-Station A, Proj. HL-19, **$150,000**; Jamaica East Health Sub-Station B, Proj. HL-20, **$150,000**, for Dpt. Health, 125 Worth St., New York, Zone 13.

N. Y., Maspeth—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Maspeth Health Sub-Station, Proj. HL-14, for Dpt. Health, 125 Worth St., New York, Zone 13. **$150,000.**

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, Lower West Side Health Sub-Station A, Proj. HL-37, **$150,000**; Lower West Side Health Sub-Station B, Proj. HL-38, **$150,000**; altering East Harlem Health Center, Proj. HL-54, **$103,000**, all for Dpt. Health, 125 Worth St., Zone 13.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, tuberculosis hospital, Proj. HO-206, **$5,600,000**; convalescent home, Proj. HO-204, **$1,900,000**, both at Welfare Island, for Dpt. Hospitals, 125 Worth St., Zone 13.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, exten. Kingsbridge Branch Library, L-5, **$80,000**; Westchester Square Branch Library addn. L-85, **$38,000**; Van Nest Library, L-78, **$155,000**; Jerome Park Branch Library, L-15, **$165,000**; Clason's Point Branch Library, L-12, **$208,000**; Morrisania Branch Library, L-87, **$46,000**; Jackson Square Branch Library, L-89, **$185,000**; Ottendorfer Branch Library, L-86, **$165,000.**

Ore., Baker—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Bend—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Corvallis—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Grants Pass—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Gresham—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Hood River—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

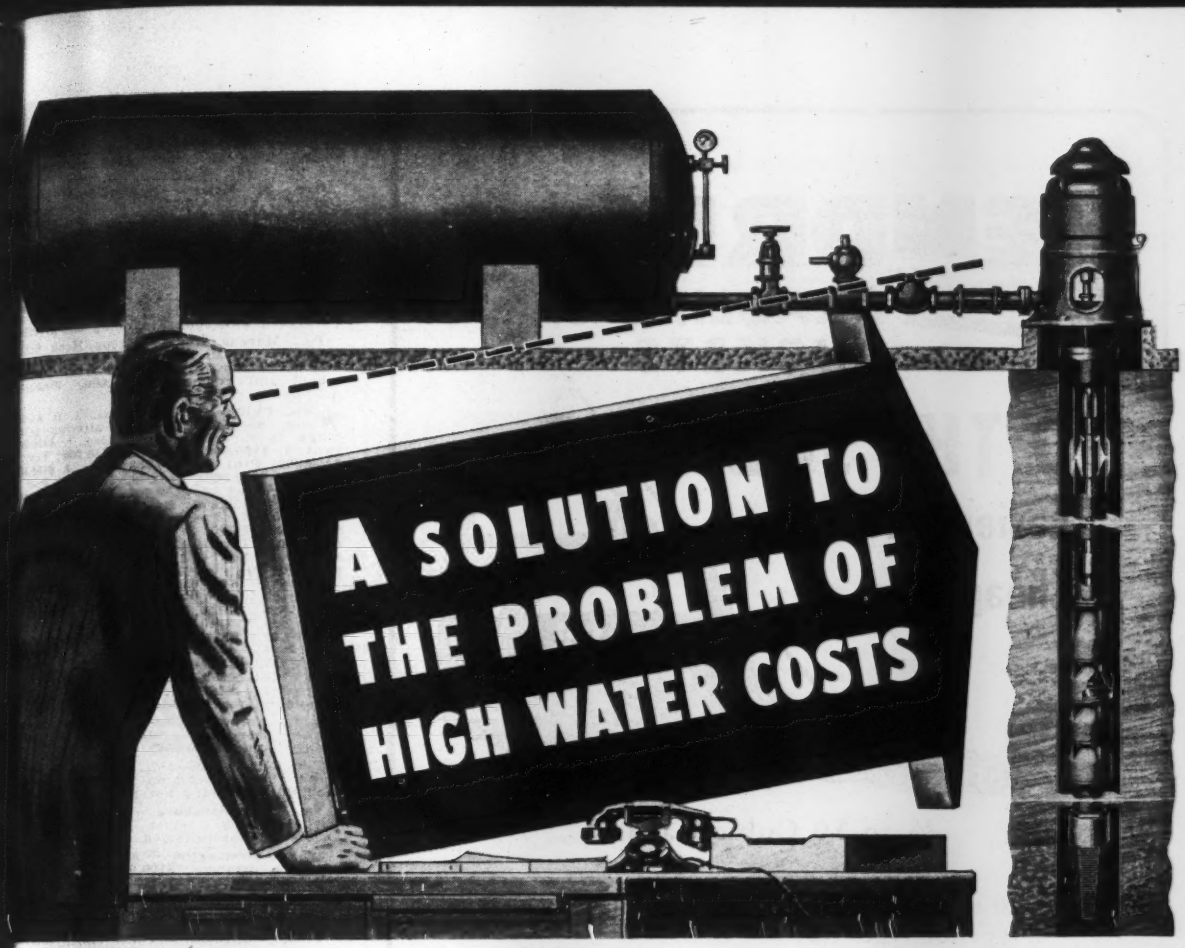
Ore., La Grande—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Lakeview—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Lebanon—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Ontario—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.

Ore., Oregon City—Oregon State Military Dpt., 412 State Office Bldg., Salem, armory. To exceed **$150,000.** Financing not provided.



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POSTWAR PROJECTS (Cont'd.)

Ore., Portland—State Bd. Higher Ed... Eugene, heating plant at University ... Oregon Medical School. $100,000. Financ... not provided.

Ore., St. Helens—Oregon State Milit... Dpt., 412 State Office Bldg., Salem, armo... To exceed $150,000. Financing not provid...

★**Ore., Salem**—State Bd. Control, Sal... ward bldg., at state hospital, $275,0... ward bldg. $270,000 and chapel-recreat... center, $190,000, at hospital farm. Financ... not provided.

Ore., The Dalles—Oregon State Milit... Dpt., 412 State Office Bldg., Salem, armo... To exceed $150,000. Financing not provid...

Pa., Marcus Hook—Marcus Hook Sch... Bd., Mrs. M. M. Campbell, secy., purcha... 5½ acre tract at 6 and Market Sts. ... school and grounds. $150,000. Financ... provided.

★**Pa., Phila.**—City Bd. Educ., A. B. And... son, secy., City Hall, altering sch... bldgs. to community use, Proj. 1, $150,... Proj. 2, $150,000; Proj. 3, $150,000; Proj. ... $150,000; Proj. 5, $150,000; Proj. 6, $150,... Proj. 7, $150,000; Proj. 8, $150,000; Proj. ... $150,000; Proj. 10, $150,000; Proj. 11, $150,... Proj. 12, $150,000; Proj. 13, $150,000; Pro... 14, $150,000; Proj. 15, $150,000; Proj. ... $150,000; Proj. 17, $150,000; Proj. ... $150,000; Proj. 19, $150,000; Proj. ... $150,000; Proj. 21, $150,000; Proj. ... $150,000; Proj. 23, $150,000; Proj. 24; $150,... Proj. 25, $150,000; Proj. 26, $150,... Proj. 27, $150,000; Proj. 28, $150,... Proj. 29, $150,000; Proj. 30, $150,... Proj. 31, $150,000; Proj. 33, $150,... Proj. 33, $150,000; Proj. 34, $150,... Proj. 35, $150,000; Proj. 36, $150,... Proj. 37, $150,000; Proj. 38, $150,... Proj. 39, $150,000; Proj. 40, $150,... Proj. 41, $150,000; Proj. 42, $150,... Financing not provided.

S. C., Columbia—Richland Co., Columbia 3 story, brick, steel, rein.-con. jail, ... county home, $100,000.

Tex., Galveston—Bd. Trustees Galveston Public Schools, Alamo 5200 N. ½, school $150,000. Financing not provided.

Va., Christiansburg — Montgomery Co., Christiansburg, court house. ... Financing not provided.

Wash., Bremerton—State National Guard, Olympia, armory. $100,000. Financing not provided.

★**Wash., Colfax**—School Bd., Colfax, high school, $300,000; 2 grade schools, $200,000. $234,358 bond election Mar. 3.

Wash., Ritzville—School Bd., Ritzville, school and remodeling high school gymnasium, $200,000. $52,175 available.

★†**Wash., Seattle**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., Naval Academy in Puget Sound Area. $15,000,000. Financing not provided.

Wash., Vancouver—State National Guard, Olympia, armory addn. $100,000. Financing not provided.

Wash., Wenatchee — Wenatchee Junior College, Wenatchee, school bldgs. ... Funds not available.

Wash., Woodland—School Bd., Woodland, school addns. $160,000.

Wis., Waupun—City, A. E. Haeft, clk., City Hall, hospital, $200,000-$300,000.

★**Ont., Fort Frances** — Town, memorial recreation bldg. About $500,000.

Ont., Galt—City, c/o Mayor Servias, City Hall, 140-bed hospital for South Waterloo. About $300,000.

P. E. I., Charlettetown—Municipality, asphalt paving plant, $40,000.

Que., Levis—Municipality, A. Adelard Begin, mayor, City Hall, civic centre, $150,000; library, $150,000.

Que., Quebec City—Municipality, industrial and commercial museum underneath Dufferin Terrace. $150,000.

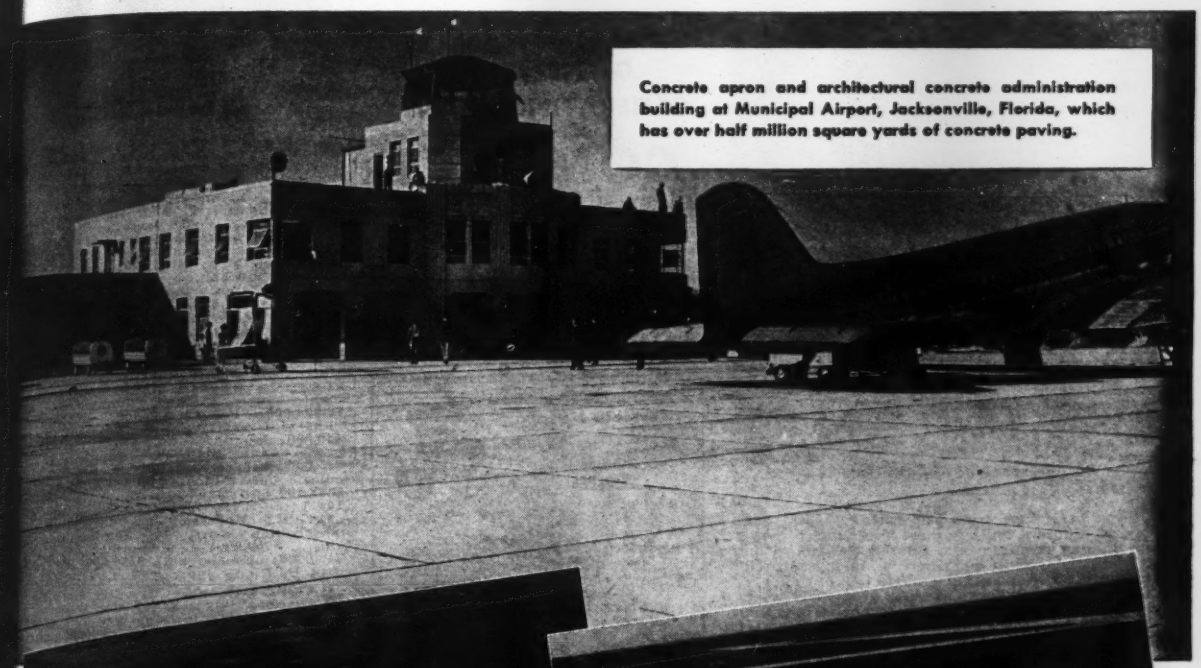
Que., Shawinigan Falls—Hospital de Ste Therese, Shawinigan Falls, plans hospital. $175,000.

PLANS UNDER WAY

★**Ala., Auburn**—Alabama Polytechnic Institute, Auburn, plans by Warren, Knight & Davis, Protective Life Bldg., Birmingham, auditorium; plans by C. Pearson, 1st National Bank Bldg., Montgomery, Student Union bldg.; plans by R. Sizemore, Bartlett Bldg., Montgomery, engineering laboratory; plans by H. L. Holm, Jr., Ozark, agronomy and horticulture bldg. $5,000,000. CD 5/1. —ENR 6/1.

Calif., Alameda—City, City Hall, library on site of existing main library, $150,000; 18 classroom addn. at Longfellow School and imprv. playground, $152,000; administration bldg. for Bd. Educ., $25,000; imprv. Grand St. fire station, $14,000; new Central Fire Dpt. Station, $32,000; West End Fire Dpt. Station, $25,000; drill tower, $6,000; remodel, enlarge clubhouse at municipal golf course, $30,000. C. Froerer, City Hall, city engr.

Calif., Arcata—State, c/o State Dpt. Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, industrial arts bldg., ... library and science hall, $191,500 at Humboldt State College.



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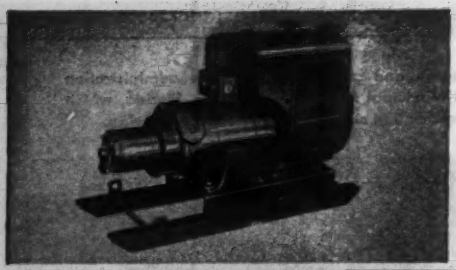

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POSTWAR PROJECTS (Cont'd.)

★**Calif., Berkeley**—Berkeley Bd. Educ., Walnut and Rose Sts., plans completed by W. G. Corlett & H. H. Gutterson, Bank of America Bldg., Oakland, auditorium, Berkeley High School, $1,000,000. Legal obstacles to be overcome, financing not provided.

★**Calif., Berkeley**—City, City Hall, city hall remodeling, addns., $350,000; fire alarm central office station, $150,000. H. Goodridge, City Hall, city engr.

★**Calif., Fresno**—State, c/o State Dpt. of Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, industrial arts shop, $123,200; men's gymnasium, $288,000; women's gym., $182,000; farm and agricultural mechanics shops, $50,000; music bldg. and auditorium, $447,500; remodeling lighting sys., $29,000, all at Fresno State College. CD 10/11/43—ENR 10/14/43.

★**Calif., Imola**—State, c/o State Dpt. of Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, constructing south ward group, Units 1, 2, 3, and 4, continued treatment wings, kitchen, dining room, etc., $2,595,000; boiler, $35,000; administration bldg. and receiving and treatment unit, $120,000; laundry addn., $85,000; sewage disposal plant, $140,000; sewage sys. lines, $15,000; concrete underpass, $31,800; tuberculosis unit addns., $450,000; juvenile unit, $223,500, all at Napa State Hospital. CD 10/11/43—ENR 10/14/43.

★**Calif., Modesto**—City, City Hall, bond election April 10, community hospital, $750,000; memorial auditorium, $400,000; new city hall, $150,000. F. J. Rose, City Hall, city engr. CD 11/15—ENR 11/18.

★**Calif., Oakland**—City, City Hall, Hall of Justice Bldg., $2,607,000; main library bldg., $1,500,000; altering city hall, $215,000; modernizing auditorium, $83,000; altering Exposition Bldg., $22,500; warehouse, $40,000; Firehouse 2, $25,000; Firehouse 7, $25,000; Firehouse 14, $28,000. W. N. Frickstad, City Hall, city engr.

★**Calif., Patton**—State, c/o State Dpt. of Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, auditorium and chapel $100,000; receiving and treatment unit, $925,000; administration bldg., $126,000; new boiler and repairs to power house, $69,000; tuberculosis unit, $900,000, all at Patton State Hospital. CD 10/11/43—ENR 10/14/43.

Calif., Riverside — Riverside Co., Court House, plans by G. Stanley Wilson, 2951 6 St., 4 story, steel, brick, concrete court-house addn., $250,000. Financing available.

Calif., Sacramento—Sacramento Co., Court House, preliminary plans by H. J. Devine, Cronan Bldg., 3 story, rein.-con., steel jail addn. $330,000.

Calif., Sacramento—Sacramento Co., Court House, preliminary plans by G. A. Sellon, California State Life Bldg., 3 story, rein.-con., steel main hospital, $320,000. CD 4/8/43—ENR 4/15/43.

★**Calif., San Luis Obispo**—State, c/o State Dpt. of Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, library and classroom bldg., $300,000; aeronautics and industrial shop bldg., $264,400; water tank and distr. sys., $10,500; powerhouse and utility distr. sys., $168,700, all at California Polytechnic School.

★**Calif., Stockton**—State, c/o State Dpt. of Architecture, P. Wks. Bldg., Sacramento, plans by A. Boyd, state archt., P. Wks. Bldg., Sacramento, ward bldg., female patients, $632,000; auditorium and chapel, $100,000; male patients ward bldg., $632,000; commissary and warehouse, $55,000; garage and automobile repair shop, $18,000; receiving and hospital unit, $1,385,000; administration bldg., $150,000; storm water sewerage sys., $68,000, all at Stockton State Hospital. CD 10/11/43—ENR 10/14/43.

Ill., Aledo—Mercer Co., C. Harris, chm. Bd. Supervs., Aledo, sketches by Wm. H. Schulzke, 1630 5 Ave., Moline, hospital, $350,000.

Ill., Aledo—School Dist. 110, Aledo, sketches by W. H. Schulzke, 1630 5 Ave., Moline, high school. Over $150,000.

Ill., Cambridge—City, City Hall, plans by Cervin & Stuhr, Safety Bldg., Rock Island, school. Over $150,000.

Ill., Fulton—High School Dist. 306, Fulton, plans 80% completed by Wm. H. Schulzke, 1630 5 St., Moline, high school. Over $150,000. Financing partially provided.

Ill., Geneseo—School Dist. 144, Geneseo, sketches by W. H. Schulzke, 1630 5 Ave., Moline, school. $250,000.

Ill., Rock Island—City, Pub. Wks. Dpt., City Hall, city garage and storage bldg., $50,000. W. J. Gallagher, City Hall, city engr.

★**Ill., Rock Island**—School Dist. 41, plans 95% completed by Cervin & Stuhr, Safety Bldg., 3 story Franklin Jr. High School, 9 St. and 13 Ave., $275,000; plans 50% completed by B. A. Horn, Rock Island Bank & Trust Bldg., 3 story Washington Junior High School addn., 18 Ave. and 34 St., $225,000, both brick, concrete fdns.; preliminary plans completed by Cervin & Stuhr, Safety Bldg., school addns., $300,000-$350,000;

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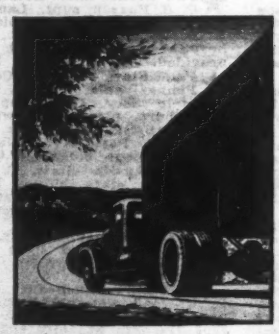

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POSTWAR PROJECTS (Cont'd.)

studies being made by R. C. Sandberg, Rock Island Bank & Trust Bldg., gymnasium, 6 Ave. & 2 St., for combined use of Central Junior High and Lincoln Elementary Schools, $80,000-$100,000; plans 8 room school 31 Ave. near 30 St., $150,000-$175,000.

Ia., Davenport—Scott Co., Court House, garage, $75,000-$100,000. J. M. Malley, Court House, co. engr.

★**Ia., Ottumwa**—Ottumwa Hospital Assoc., Ottumwa, plans 75% completed by D. D. Morgan, Farmer & Merchant Bank Bldg., Burlington, 3 story, bsmnt., rein.-con. hospital, $550,000. Beling Engineering Co., 501 15 St., Moline, Ill., consult. engr.

Md., Loch Raven—State Training School for Boys, Loch Raven plans 10% completed by Palmer & Lamdin, 1020 St. Paul St., Baltimore, dormitory cottage, combination gymnasium and chapel, altering refrigeration plant, $271,500. J. Posey, 10 E. Pleasant St., Baltimore, mechanical engr. Van Resselaer V. Saxe, 100 W. Monument St. Baltimore, structural engr. CD 12/15—ENR 12/23.

Mass., Gloucester — Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, plans by Fay Spofford & Thorndike, 11 Beacon St., Boston, brick, steel, concrete freezing plant. $250,000.

★**Mass., Salem**—City, Pub. Property Dpt., City Hall, preliminary survey started housing development on Forest Ave. To exceed $500,000. F. Morse, City Hall, city engr.

Mich., Detroit—Dpt. Parks & Recreation, 735 Randolph St., plans completed Lasky Recreation Center Gymnasium, brick, steel, rein.-con., stone. $175,000. Financing not provided. G. R. Thompson, City Hall, city engr.

Mich., Detroit—Dpt. P. Welfare, City Hall, plans 10% completed Receiving Hospital, imprvs., addns. $368,200. R. G. Thompson, City Hall, city engr.

Minn., Minneapolis—State, c/o Bd. Regents University of Minnesota, W. T. Middlebrook, comptroller, Main Campus, plans by C. H. Johnston 715 Empire Bank Bldg., St. Paul, men's dormitory bldg., on main campus. $400,000.

★**Minn., St. Paul**—State Dpt. Admin., State Capitol, plans by P. C. Bettenburg & Co., 1487 Marshall Ave., 220x420 ft., rein.-con., steel, granite armory, incl. drill hall and 4 story head house at each end, etc., on Exchange St. between Cedar and Wabasha Sts. $1,500,000.

★**Mo., Kirkwood (St. Louis, Zone 22, P. O.)** Kirkwood School Dist., F. P. Tillman pres. Bd. Educ., 702 South Kirkwood Rd., Kirkwood, St. Louis, Zone 22, approved $650,000 bond issue, imprv. school sys. incl. new school in North Kirkwood on Quan Ave. and addn. to J. Milton Turner School at Saratoga and Milwaukee Aves., also repairing other bldgs. Bonsack & Pearce, Inc., 408 Olive St. St. Louis, Zone 1, archts. CD 1/23—ENR 2/8.

Neb., Beatrice—Gage Co., Beatrice, plans 50% completed 1 story, native limestone repair shop and equip storage bldg. $75,000. Financing not provided. R. H. Eddy, Beatrice, co. engr.

Neb., Scottsbluff—City, municipal bldg. $150,000. O. S. Cooper, Gering, acting engr.

★**Nev., Carson City**—State, c/o State Planning Bd., Carson City, imprv. Capitol Bldg., $50,000; Capitol Bldg. extens., $457,-928; 3rd story addn. to Supreme Court and Library Bldg., $45,000; bldg., $226,000; reconstructing state armory bldg., $57,100; Tuberculosis Hospital providing 50 beds (exact locations undecided), $175,500; modernization and new construction at Nevada State Children's Home (Orphans' Home), $164,100; major imprvs., addns., Nevada State Prison, $261,864 incl. 4 story cell block, $158,200; 3rd floor addn. to hospital, $46,200; alterations, $30,000, and security wall, $26,-064. R. A. Allen, state hy. engr., chn. comn., and A. Merritt Smith, state engr. on comn., both Carson City.

Nev., Elko—State Planning Comn., Carson City, steel frame armory and garage $91,160; Nevada State School of Industry imprvs., addns. $45,003. R. A. Allen (state hy. engr.) chn. comn. and A. Merritt Smith (state engr.) on comn., both Carson City.

Nev., Las Vegas—Clark Co., Court House, plans by DeLongchamps & O'Brien, Gazette Bldg., Reno, court house addn. Over $200,000.

Nev., Las Vegas—State Planning Comn., Carson City, steel, frame armory and garage, $91,160; 1 story rein.-con. vocational educational school, $190,000. R. A. Allen, state hy. engr., chn. comn. and A. Merritt Smith, state engr., on comn., both Carson City.

★**Nev., Reno**—State, c/o State Planning Comn., Carson City, steel, frame armory and garages, $130,380; 8-bed crippled children hospital addn., to Washoe Co. General Hospital, $15,000; Dpt. Health Bldg., $50,-880; 1 story, rein.-con. vocational educational school, $190,000; University of Nevada imprvs., addns., incl. complete heating plant $89,500, 2 story, rein.-con., and brick classroom bldg. $365,000, move, convert English Hall $15,000, 2 story, rein.-con., brick wing addn. to Engineering Bldg. $100,000, Life Science Bldg. $450,000, Student Union Bldg. $497,000, brick, concrete administration bldg. $195,000, modern fire resistant maintenance shop bldg. $39,000, reconstruct old gymnasium to R.O.T.C. Armory $19,625, greenhouse addn. $12,000, imprv. dormitories $108,294, 2 rein.-con., brick wings to Lincoln Hall $195,513, mechanical arts bldg., $175,000, farm shop bldg. $40,000. R. A. Allen (state hy. engr) chn. comn. and A. Merritt Smith state engr. on comn., both Carson City.

★**Nev., Reno**—Washoe Co., Court House, plans by DeLongchamp & O'Brien, Gazette Bldg., reconstructing Washoe Co. Court House and Jail. $500,000. CD 3/11/43—ENR 3/18/43.

★**Nev., Sparks**—State, c/o State Planning Comn., Carson City, imprv. Nevada State Hospital for Mental Diseases, heating plant, observation and hospital ward, tunnel, kitchen, bakery and attendants' dining room, male patients' ward, landscaping, female patients' ward, women's day room, reading and occupational bldg., reconstructing creamery and laundry, etc. $718,500. R. A. Allen, state hy. engr., chn. comn. and A. Merritt Smith, state engr. on comn., both Carson City.

Nev., Winnemucca—State Planning Comn., Carson City, steel frame armory and garage, $91,160. R. A. Allen, (state hy. engr.) chn. comn., and A. Merritt Smith (state engr.) on comn., both Carson City.

N. H., Concord—Office State Comptroller, State House, plans completed by A. T. Granger Associates, Main St., Hanover, 1 story nurses home addn., $225,000. Financing not available. R. D. Kimball Co., 6 Beacon St., Boston, consult. engr. CD 3/13.

N. H., Concord—State Controller's Office, State House, plans by Alfred T. Granger Assoc., Main St., Hanover, brick, concrete, steel refrigerating bldg. $40,000. Financing not provided.

N. J., Livingston—Bd. Educ., 12 W. Northfield Ave., plans by F. A. Eleasser, 1000 Stuyvesant Ave., Union, school. $300,000.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by V. W. Tandy, 1974 Bway., Zone 23, garage and storehouse at Lincoln Hospital. Proj. HL-126, for Dpt. Hospitals, 125 Worth St., Zone 13. $111,000. CD 11/9—ENR 11/30.

★**O., Euclid**—Euclid Bd. Educ., L. Pallard, pres., 1520 Chardon Dr., plans 10% completed by H. A. Fulton, 6014 Euclid Ave., Cleveland, high school and stadium, $750,000. Land rights not cleared. Bond issue approved.

O., Oxford—Bd. Trustees Miami University, Oxford, plans by C. F. Celarius, 111 E. 4 St., Cincinnati, 3 story, brick, concrete dormitory $300,000. Legal obstacles to be overcome. Fosdick & Hilmer, Union Trust Bldg., Cincinnati, consult. engrs. T. E. Brand, State Office Bldg., Columbus, state archt.

O., Napoleon—City Bd. P. Wks., City Hall, plans under way remodeling municipal power plant. $124,000. Financing provided.

Okla., Claremore—Bd. Affairs, Capitol, Oklahoma City, plans 5% completed addn. science hall, at Oklahoma Military Academy. $160,000. Financing not provided.

★**Ore., Corvallis**—State Bd. Higher Educ., Eugene, plans by Stanton & Johnston, Railway Exch. Bldg., Portland, men's and women's dormitory bldgs., rein.-con., $750,-000; plans by Jones & Marsh, Woodlark Bldg., Portland, physical education bldg. with pavilion at Oregon State College, $750,-000. Financing not provided. CD 12/21—ENR 1/11.

★**Ore., Eugene**—State Bd. Higher Educ., Eugene, Dr. S. D. Byrne, secy., plans by Lawrence & Lawrence, Failing Bldg., Portland, 3 story, bsmnt. student union bldg., $700,000; women's dormitory, $230 000; classroom and laboratory bldg., $000,000, all rein.-con., at University of Oregon. Financing not provided. CD 6/5, 12/21—ENR 6/15, 1/11.

★**Ore., Portland**—State Bd. Higher Educ., Eugene, plans by Lawrence & Lawrence, Failing Bldg., general hospital at University of Oregon Medical School. $750,000. Financing not provided. CD 12/21—ENR 1/11.

★**Pa., Drexel Hill**—Delaware Co. Hospital, C. S. Paxson, supt., Lansdowne and Keystone Aves., preliminary plans by Zantzinger & Borie, 1531 Locust St., Phila., 11 story hospital addn. $2500,000. Financing not provided. CD 2/8—ENR 2/22.

★**Pa., State College**—Commonwealth of Pennsylvania, c/o A. J. Warlow, ch. engr. to Secy. Dpt. Property & Supplies, Harrisburg, plans by Lawrie & Green, 321 N. Front St., Harrisburg, and Gehron & Ross, 101 Park Ave., New York, N. Y., imprv. college bldgs. $7,000,000.

Tex., Austin—State, C. Stevenson, gov., ★Austin, state bldgs., Projs. 1 and 2. Over $3,000,000. H. F. Ruehne, c/o Capital Planning Bd., Austin, consult. archt. CD 10/1/43—ENR 10/7/43.

★**Tex., Brownsville**—City, rebuilding electric power and light plant. $600,000. Financing not provided. W. J. Ehlers, Brownsville, engr.

Tex., Brownwood—City and Brown Co., Brownwood, veterans hospital. $150,000. Financing not provided. C. W. McClelland, 1209 Durham St., city engr. CD 5/4—ENR 5/13.

Tex., Buenavista — Buenavista Ind. School Dist., D. E. Coffey, supt., Imperial plans by Haynes & Strange, 415 Myrick Bldg., Lubbock, replacing school, recently destroyed by fire, to be combination of grade and high school, $200,000 bond election soon.

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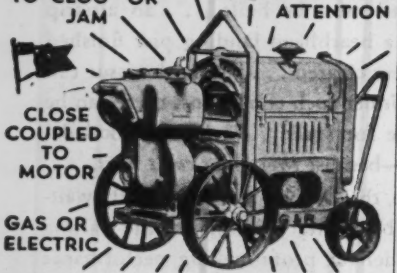

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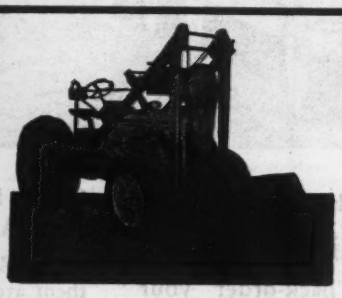

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POSTWAR PROJECTS (Cont'd

★**Tex., Corpus Christi**—City of Corpus Christi and Nueces Co., Corpus Christi, plans 25% completed by Brock, Anderson, Jones Bldg., hospital. $1,235,000. Financing not provided. Matthews & Kenan, Transit Tower Bldg., San Antonio, consult. engrs. C. S. Moor, City Hall, city plan engr. CD 3/22/43—ENR 3/25/43.

Tex., Crane—Bd. Educ., Crane, plans 25% completed by Haynes & Strange, 415 Myrick Bldg., Lubbock, brick, natural stone, concrete high school. $350,000. Bonds voted. CD 12/11—ENR 12/28.

Tex., Denton—City, City Hall, making surveys light plant and improvs. $300,000. Financing not provided. J. E. Ward, Harvey-Snider Bldg., Wichita Falls, consult. engr.

Tex., Galveston—Bd. Trustees Galveston Public Schools, Alamo 5200 N½, plans by R. R. Rapp, consult. archt., Guaranty Bldg., high school. $225,000. Purchased 3 block site. Financing not provided. CD 1/17—ENR 2/8.

Tex., Galveston—City and Galveston Co., Galveston, city-county health unit. $150,000. Financing not provided. C. C. Washington, Court House, engr.

Tex., Galveston—Galveston Co., R. H. Markwell, judge, courthouse. $450,000. Financing not provided. C. C. Washington, Courthouse, engr.

Tex., Highland Park (Dallas)—Highland Park Ind. School Dist., H. E. Gable, supr., 3510 Normandy Dallas, plans 50% completed by Thos. D. Broad, Burt Bldg., Dallas, brick, hollow tile, concrete school. $200,000. Financing available. CD 11/15—ENR 11/30.

Tex., Laredo—City, City Hall, city hall, $300,000. Financing not provided. F. C. Heins, Box 562, city engr. CD 1/10—ENR 1/25.

Tex., Laredo—City, City Hall, school addns. $150,000. Financing not provided. F. C. Heins, Box 562, city engr. CD 1/10—ENR 1/25.

Tex., Odessa—Bd. Educ., Odessa, plans 50% completed by Haynes & Strange, 415 Myrick Bldg., Lubbock, 2 story, rein.-con. frame and fdn., natural stone, tar and gravel roof, etc. high school. $450,000. Funds available. CD 12/28—ENR 1/11.

Tex., Pearland—Independent School Dist., Pearland, plans 25% completed by Hedrick & Lindsley, 811 So. Standard Bldg., Houston, high school. $150,000. Bonds voted. CD 2/14.

Tex., Raymondville — Raymondville Ind. School Dist., Raymondville, plans 25% completed by Hedrick & Lindsley, 811 Southern Standard Bldg., Houston, school. $150,000 bond election March 10.

★**Tex., San Antonio**—Bd. Trustees Bexar Co., c/o C. G. Carter, Junior College Dist., plans 50% completed by Phelps & DeWees & Simons, Majestic Bldg., School Junior College bldgs., Proj. 1-5. $800,000. Financing not provided. CD 12/27—ENR 1/11.

Tex., San Antonio—City, City Hall, plans bond election, auto repair shop. $100,000. Financing not provided. M. L. Diver, City Hall, engr.

Vt., Rutland—City, City Hall, garage for Dpt. P. Wks., and fire station. $13,000. Financing not provided. W. V. Kallio, City Hall, city engr.

Vt., St. Johnsburg—Town, Supt. Schools, St. Johnsburg, plans by Alfred T. Granger Assoc., Main St., Hanover, 3 story, bsmt., brick, concrete school, $325,000. Financing not provided.

W. Va., South Charleston—Town, plans by H. S. Kyle, Union Bldg., Charleston, 2 story, 46x92 ft., brick city hall addn., 1 story, 32x60 ft., brick fire station. $100,000. Land rights not cleared, legal obstacles to be overcome, financing not provided. M. C. Catlette, City Hall, engr.

★**W. Va., Wheeling**—City of Wheeling and Ohio Co., Wheeling, plans by F. Faris, 1117 Chapline St., 110x180 ft., city-county departments office bldg. $1,125,000. W. Stegman, Bd. Comrs., city engr.

Wis., Burlington—Bd. Educ., N. E. Karcher, clk., City Hall, preliminary plans completed by Oppenhamer & Obel, Green Bay, ground floor and 2d story concrete, brick, tile, steel high school addn. $300,000.

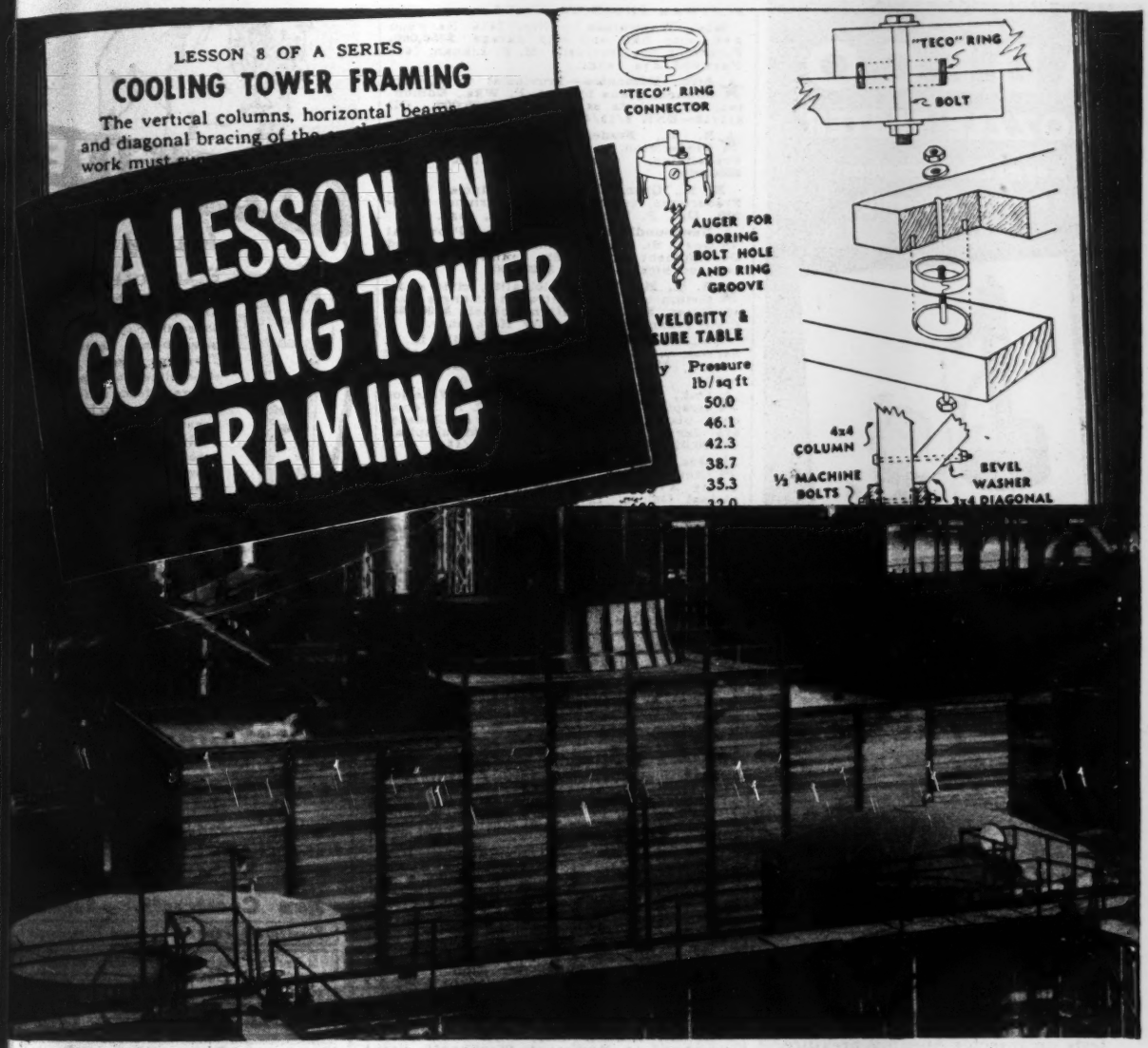
Wis., Janesville—City, City Hall, plans 50% completed Street Dpt. shops and storage garage. $90,000. Land rights not cleared. J. Lustig, City Hall, city engr. CD 11/15—ENR 11/30.

Wis., Janesville—City, City Hall, plans 25% completed by Law, Law & Potter, 121 S. Pinckney St., Madison, vocational school addn. $400,000. Land rights not cleared. CD 8/23—ENR 9/7.

Wis., Neenah—City, 208 S. Commercial St., plans 75% completed community bldg. containing recreation rooms, rest rooms, club rooms, meeting rooms, Riverside Park. $100,000. A. G. Prunuske, City Hall, city engr.

Wis., Waukesha—City, City Hall, community bldg. $250,000. Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waukesha—City, City Hall, plans completed hospital addn. $327,000. Financing not provided. W. E. Dick, City Hall, city engr.



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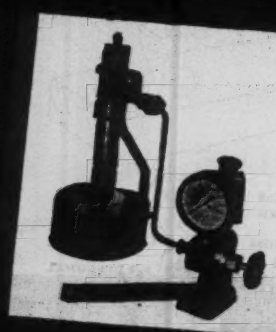

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POSTWAR PROJECTS (Cont'd.)

Wis., Wauwatosa — City, 7616 Harwood Ave., city hall and city garage. $250,000. Financing not provided. M. F. Linnan, 7616 Harwood Ave., engr.

★**Alta., Edmonton**—Provincial Govt., Edmonton, plans by Dpt. P. Wks., Edmonton, tuberculosis sanatorium, $800,000. CD 8/5/43—ENR 8/12/43.

★**N. B., Fredericton**—Provincial Govt., Fredericton, plans by Dpt. P. Wks., Fredericton, new administration bldg. $600,000.

N. B., Grand Falls — Provincial Govt., Fredericton, tuberculosis sanitarium. $300,000. Dpt. P. Wks., Fredericton, engr.

★**Newfoundland, St. John's** — Provincial Govt., St. John's, plans by Newfoundland Development Comn., St. John's, secondary and technical school. $500,000.

★**N. S., Halifax**—Municipality, civic auditorium and art centre on triangle east of Queen Elizabeth High School, $500,000. Civic Planning Comn., City Hall, engr.

Ont., Galt—City, C. T. Chesney, clk., R. K. Serviss, mayor, City Hall, city hall or civic centre. $250,000. R. M. Hall, 9 Cathay St., archt.

★**Ont., Kitchener** — Kitchener-Waterloo Hospital Bd., King St. W., C. N. Weber, chn., plans by Govan, Ferguson & Lindsay, 515 Jarvis St., Toronto, 250-bed hospital, $1,200,000. CD 8/31/43—ENR 9/9/43.

★**Ont., London**—Victoria Hospital, Dr. L. J. Crosier, supt., Wm. Loveday, chn., Ottaway Ave., plans by T. C. McBride, Municipal Offices, London, 3 hospital wings. About $200,000. CD 1/39.

Ont., Ottawa—Dominion Govt., Ottawa, plans by Dpt. P. Wks., Ottawa, Civil Service Comn., bldg. $350,000.

Ont., St. Thomas—St. Thomas Pub. Utilities Comn., 474 Talbot St. E. Duckworth, chn., 10-truck garage and workshop, St. Catherine St., 1,500 kva. outdoor transformer type station, etc. $144,500. W. J. Peart, c/o owner, engr. CD 1/14/44—ENR 1/27/44.

P. E. I., Summerside—Municipality, plans by E. S. Blanchard, Cameron Block, Charlottetown, 100-bed hospital, $250,000.

Que., Shawinigan Falls—Rev. Grey Nuns of the Cross, 9 Water St., Ottawa, Ont., plans by A. Lacousiere, 101 4 St., 2 wings at St. Therese Hospital. About $230,000.

READY FOR BIDS

Fla., Jacksonville—City, City Hall, plans completed storage garage and paint shop at Police Headquarters, $30,000; Juvenile Court bldg., for Police Dpt., $35,000. Financing provided. W. E. Shedden, Engineers Bldg., engr.

★**La., Jackson**—East Louisiana State Hospital, c/o Bd. Directors, Baton Rouge, plans completed by Edw. F. Neild, City Bank Bldg., Shreveport, hospital housing 230 patients, $275,000; hospital housing 216 patients, $225,000; hospital housing 50 patients, $150,000; hospital housing 330 patients, $300,000. Financing available. CD 12/23—ENR 1/11.

Minn., Fergus Falls—Bd. Educ., A. V. Vollbrecht, clk., plans completed by Foss & Co., Fergus Falls, school addn. $300,000. R. L. Bloom, 633 Sexton Blk., Minneapolis, consult. engr. CD 1/31/45.

N. M., Roswell—City, City Hall, plans completed by Vorhees & Standhardt, Roswell, ward school, $150,000; school, $125,000. Financing provided. Headman, Ferguson, Carollo & Clausen, 412 Martin Bldg., El Paso, Tex., consult. engrs. L. Rowland, City Hall, city engr.

★**N. Y., New York**—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans completed by Wm. Gehron, 101 Park Ave., New York, Zone 17, P.S. 193, 2 story, 161x441 ft., Amsterdam Ave. $2,925,000. CD 12/8/43—ENR 12/16/43.

S. C., Columbia—Richland Co., Columbia, 3 story, brick, steel, rein.-con. jail, $251,000; county home, $100,000.

Tex., Austin—City, W. E. Seaholm, mgr., City Hall, plans completed abattoir, $40,000. Financing available.

Tex., Bishop—Bishop Independent School Dist., Bishop, plans completed by Hendrick & Lindsley, 211 S. Standard Bldg., Houston, school. $150,000. Financing available. CD 4/3—ENR 4/20.

Tex., Port Aransas—University of Texas, c/o Zoological Dpt., Austin, plans completed marine laboratory. $40,000. Funds available.

W. Va., Huntington—City, City Hall, plans completed by Frampton & Bowers, Huntington, Zone 1, city garage. $170,000. F. S. Whitney, City Hall, city engr. CD 11/21—ENR 12/14.

COMMERCIAL BUILDINGS

PROPOSED WORK

★**Calif., Angwin**—Pacific Union College, Angwin, library bldg., dormitory for women students, gymnasium, and enlarging science bldg. $500,000.

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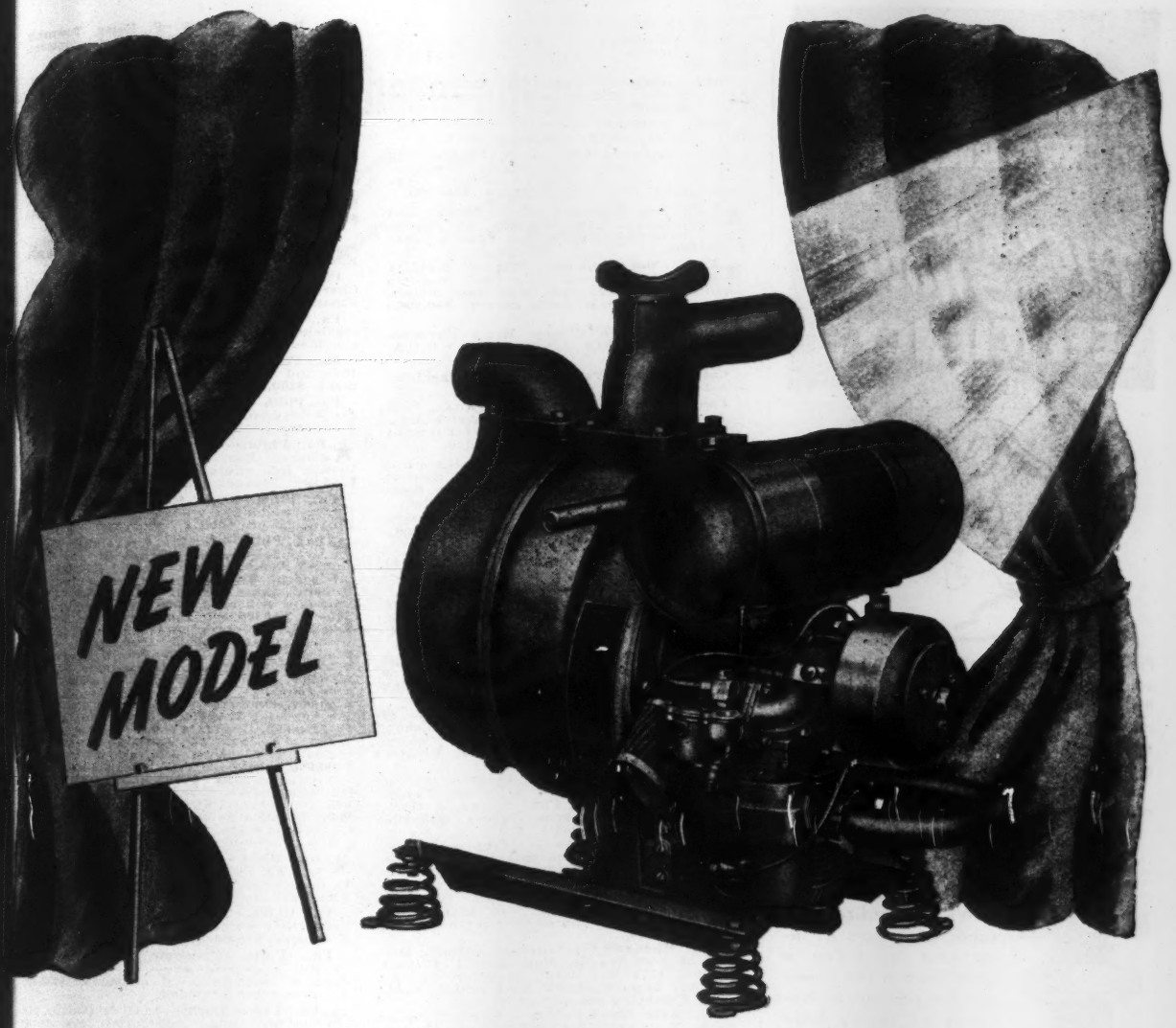

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POSTWAR PROJECTS (Cont'd.)

Calif., Broderick—H. H. Hart & E. L. Erwin, 919 K St., Sacramento, hotel and inn, $250,000.

Calif., Oakland—Concordia College, 64 Ave., Brann, library and administration bldg. $175,000.

Calif., Oakland—Sherman, Clay & Co., H. C. Capwell Bldg., 3 story music bldg.

Calif., Redwood City—A. N. Paterson, S. Bright, O. Brobert & R. Meyer, 1004 Hopkins Ave., new shopping center incl. large food market and smaller shops, $150,000.

★**Calif., San Francisco**—E. B. DeGolia and Benjamin H. Swig & Assoc., St. Francis Hotel, modernizing Hotel St. Francis. Over $1,000,000.

★**Calif., San Francisco**—Mayfair Building Corp., 824 Taraval St., 1,000 multiple dwelling unit bldgs., incl. apartment houses, flats, and modern shopping center. $40,000,000.

Calif., Stockton—Young Men's Christian Assn., 135 N. San Joaquin St., Y.M.C.A. bldg. $325,000.

Colo., Denver—P. G. Dikeou, 178 Ash St., theatre, $150,000.

Conn., Granby—St. Bernard's Parish, J. T. Connor, pastor, Tariffville, 1 story, bsmnt., brick, stone church, North and West Granby Sts. $150,000. Financing not provided.

Conn., Hartford—Connecticut Historical Society, 624 Main St., brick, stone historic bldg., Hartford Center, adjacent to State Library, $150,000. Financing not provided.

★**Conn., Stamford**—L. N. Lapine, Crane St., frame homes, High Ridge Rd. $500,000. Financing not provided.

Conn., Stamford—Stamford Department Store, Inc., 229 Atlantic St., brick, steel department store, Atlantic St. $150,000.

Ill., Chicago—Temple Isaiah Israel, S. Greenwood and E. Hyde Park, 2 story, brick, concrete school and auditorium. $200,000. Financing not provided.

Ind., Fort Wayne — Fort Wayne Gospel Temple, Rudisill Blvd. and Clinton Ct., 4 story, bsmnt., brick missionary training school west of present temple. $200,000.

Ind., Gary—Roman Catholic Diocese of Fort Wayne, Most Rev. J. F. Noll, Bishop, 1122 S. Clinton St., Fort Wayne, 2 story, bsmnt., brick high school, $400,000. Financing not provided.

Ind., Hammond—Roman Catholic Diocese of Fort Wayne, Most Rev. J. F. Noll, Bishop, 1122 S. Clinton St., Fort Wayne, 2 story, bsmnt., brick high school addn. $250,000. Financing not provided.

★**Ind., Lafayette** — St. Francis College, Lafayette, residence hall, incl. cafeteria, office for dean of women, and quarters for home economics dpt. $500,000.

Ind., Indianapolis—St. Pauls Episcopal Church, Rev. W. A. Burrows, pastor, New and Illinois Sts., church, on north side of city. $200,000.

Ind., Michigan City—Roman Catholic Diocese of Fort Wayne, Most Rev. J. F. Noll, Bishop, 1122 S. Clinton St., Fort Wayne, 2 story, basmnt., brick high school. $400,000. Financing not provided.

La., Lake Charles—Young Men's Christian Assn., V. Geiger, Finance Div., Lake Charles, Y.M.C.A. bldg., incl. swimming pool, $250,000. Financing not provided.

La., New Orleans—Texas Co., J. M. Dose, div. mgr., 919 St. Charles St., headquarters bldg. addn.

Mass., Brookline—Staley College of the Spoken Word, 162 Babcock St., new bldg. $150,000. Financing not provided.

Mass., Northampton—Smith's Agricultural School, P. Fox, dir., Northampton, rebuilding mechanics arts bldg. $200,000. Financing not provided.

Mass., Springfield—St. Thomas Aquinas Church, Rev. Wm. LeClaire, 35 Harriet St., school, Harriet St. To exceed $150,000. Financing not provided.

Mass., West Boylston—Roman Catholic Diocese, Bishop of Diocese, Springfield, brick, stone church, Worcester St. $150,000. Financing not provided.

Mass., Worcester—Trustees of Holy Cross College, Worcester, gymnasium. Over $300,000. Financing not provided.

Mont., Billings—Young Men's Christian Assn., Billings, recreational bldg. with gym., swimming pool, etc. $200,000. Financing not provided.

N. J., Camden—Progressive Builders, Inc., 505 Cooper St., residential development. $150,000. Financing available.

N. Y., Buffalo—Sattler's, A. Rabow, vice pres. and genl. mgr., 998 Bway., 3 story, bsmnt. store addn. Over $150,000.

★**O., Cleveland**—St. Luke's Hospital, R. F. Bingham, pres., 11600 Shaker Blvd., nurses' home and teaching school, $500,000. Financing provided.

★**O., Tiffin**—Heidelberg College, Tiffin, men's dormitory, physical education bldg., home management house, fine arts bldg., and infirmary, $1,500,000. Financing not provided.

Ore., Portland — University of Portland, Rev. C. C. Miltner, school pres., N. Wilmet Ave. and Fiske St., engineering bldg. $500,000.

Pa., Drexel Hill—W. P. Foley, Township line and Treaty Rd., residential development, $250,000. Financing provided.

Pa., Phila. and Cheltenham—W. S. Bauer, 7247 Ogontz Ave., Phila., residential developments, $150,000. Financing provided.

Pa., Phila.—J. A. Fischer, Inc., 502 W. Godfrey Ave., residential development, $150,000. Financing provided.

Pa., Phila.—Frontenac Homes, Inc., 6101 Frontenac St., residential development, $250,000. Financing provided.

Pa., Phila.—Germantown Jewish Centre, 6815 Emlen St., synagogue. To exceed $150,000. Financing not provided.

Pa., Phila.—Hellerman Corp., 1411 Hellerman St., residential development, $150,000. Financing provided.

Pa., Phila.—G. Thomas Holloway, 1015 Cherry St., residential development, $200,000. Financing provided.

Pa., Phila.—A. Kaplan, 230 S. Hanson St., residential development, $250,000. Financing provided.

Pa., Phila.—Thos. Kelly & Sons, Limekiln Pike and Thouron Ave., residential development, $250,000. Financing provided.

Pa., Phila.—R. Killough, Wayne and Duval Sts., residential development, $150,000. Financing provided.

★**Pa., Phila.**—Shrine Church of The Little Flower, Rev. J. M. Toohey, rector, 641 Vernon Rd., church, $250,000; parish school, $250,000. Financing available.

Pa., Phila.—Emil P. Stahl & Son, Welsh Rd., residential development, $250,000. Financing provided.

★**Pa., Phila.**—Temple University, Dr. R. L. Johnson, pres., Broad St. and Montgomery Ave., pharmacy school $750,000, dental school $1,000,000, Financing provided; Undergraduate School 4 $500,000, Undergraduate School 3 $500,000, Undergraduate School 2 $500,000, Undergraduate School 1 $500,000, Undergraduate School 9 $250,000, Undergraduate School 8 $250,000, Undergraduate School 7 $250,000, Undergraduate School 6 $500,000, Undergraduate School 5 $500,000, Graduate School 5 $250,000, Graduate School 4 $250,000, Graduate School 3 $250,000, Graduate School 2 $250,000, Graduate School 1 $250,000, Undergraduate School 10 $250,000, Graduate School 6 $250,000, Professional School 1 $500,000, Professional School 2 $500,000, Professional School 3 $500,000, Professional School 4 $500,000, administration bldg., $250,000, auditorium $500,000, gymnasium $250,000, Dormitory 4 $150,000, Dormitory 3 $150,000, Dormitory 2 $150,000, Dormitory 1 $150,000, athletic fields, tennis courts, etc. $100,000, Financing not provided. Sites not selected.

★**Pa., Phila.**—J. Tolt, 220 S. 16 St., converting Cunard Bldg., from office bldg. to apartment house, 220 S. 16 St. $2,000,000. Financing not provided.

Pa., Phila.—Traub Built Homes, Inc., 1530 Locust St., residential development, $150,000. Financing provided.

Pa., Phila.—University of Pennsylvania, 34 and Woodland Ave., Dr. Althea Hottel, dean of women, co-ed clubhouse. $150,000. Financing not provided.

★**Pa., Upper Darby**—J. H. McClatchy, McClatchy Bldg., residential development, $300,000. Financing provided.

Pa., Upper Darby—Tyson Constr. Co., Garrett Rd. and Chestnut St., residential development, $250,000. Financing provided.

★**Pa., Upper Darby**—Warner-West Corp., 7052 Garrett Rd., residential developments, $1,000,000.

R. I., East Providence—Riverside Congregational Church, Rev. R. C. Marriott, 18 Oak Ave., church and parish house. Oak Ave. To exceed $150,000. Financing not provided.

R. I., Newport—St. Augustine's Roman Catholic Church, Rev. J. P. Coleman, pastor, Harrison Ave., brick, stone convent, $200,000. Financing not provided.

R. I., Woonsocket—Young Men's Christian Assn., V. H. Bergen, 43 Federal St., YMCA addn. Over $150,000. Financing not provided.

Tex., Dallas—Congregation Shearith Israel, 1324 Park St., hospital, $150,000. Financing not provided.

★**Tex., Dallas**— Southern Methodist University, Dallas, dormitory for married students, $150,000; dormitory for theological students, $150,000; class-room bldg., $150,000; chapel, $100,000 or more. Financing provided. CD 9/1/43—ENR 9/23/43.

Tex., Weatherford—Weatherford College, Weatherford, dormitory, $150,000; administration bldg. and auditorium $150,000; classroom and science bldg., $150,000. Financing not provided.

B. C., Vancouver—British Columbia Electric Railway Co., Operative Society, F. B. Dickinson, secy., headquarters bldg., on Mount Pleasant site, incl. auditorium seating 1,000 persons, smaller meeting halls, lounges, library, safety deposit vaults, coffee shop, bowling alley, etc. Over $150,000.

★**N. S., Halifax**—Bd. Governors Dalhousie University, Dr. C. W. Stanley, pres., arts and science bldg. $600,000. CD 8/22—ENR 9/7, under Dalhousie.

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POSTWAR PROJECTS (Cont'd.)

Ont., Galt—Iroquois Hotel, [illegible], Main St., hotel exten. **$150,000.**

Ont., Oshawa—Young Men's Christian Assn, Oshawa, new Y.M.C.A. **$150,000.**

Ont., Owen Sound—The Fleming Publishing Co., Ltd., 3 Ave. at 9 St. E., newspaper plant-office bldg. About **$175,000.**

Ont., Owen Sound — D. Keeling, Owen Sound, stone office bldg., Third Ave. E, north of 10 St. E. About **$175,000.**

★**Que., Maisonneuve (Postal Dist. Montreal)** —Protestant Central School Bd., 3460 McTavish St., Montreal, high school. **$500,000.** Site purchased.

Que., Montreal—Protestant Central School Bd., 3460 McTavish St., high school, Park Ave. exten. **$300,000.** Site purchased. CD 6/30—ENR 7/13.

★**Que., Notre Dame de Grace (Postal Dist. Montreal)** — Protestant Central School Bd., 3460 McTavish St., Montreal, high school. **$500,000.** Site purchased.

Que., Quebec City—Rev. Sisters Servantes Du Saint Sacrement, La Capriccieuse St., church. About **$250,000.**

Que., Quebec City—Roman Catholic School Comn., Quebec City, school, Prairies St. and hall in St. Jean Baptiste Ward. **$170,000.**

PLANS UNDER WAY

Ariz., Tucson—Levy's Dpt. Store, Congress and Scott Sts., preliminary plans by M. P. Miller, 111 W. 7 St., Los Angeles, Calif., 3 story, mezzanine, bsmnt., 105x150 ft., rein.-con., steel department store. **$400,000.** Financing available.

Calif., Fresno—Peerless Pump Div. of Food Machinery Corp., 1755 Bway., plans by H. Rafael Lake, Clovis Ave., steel, brick store and shop bldg.

★**Calif., Inglewood**—Sears Roebuck & Co., 2650 E. Olympic Blvd., Los Angeles, plans by S. Clements, 1235 Van Nuys Bldg., Los Angeles, 265x285 ft., brick, plaster rein.-con. storage bldg., Manchester Blvd. and Hillcrest Ave. **$1,500,000.** CD 8/24—ENR 9/7.

Calif., Los Angeles—Sears Roebuck & Co., 2650 E. Olympic Blvd., plans 40% completed by S. Clements, 1235 Van Nuys Bldg., 2 story, bsmnt., 76x206 ft. and 42x44 ft. wing, rein.-con. addn. to store, Vermont and Slauson Aves., and extensive alterations existing bldg. Over **$150,000.**

★**Calif., Los Angeles**—S. L. Taylor, c/o Risely & Gould, archts., 220 S. Westmoreland Ave., preliminary plans 13 story, bsmnt., sub-bsmnt., office and loft bldg., 9 St. from Los Angeles to Santee Sts. **$1,500,000.**

Calif., San Mateo—Mills Memorial Hospital, 95 South El Camino Real, San Mateo, plans by T. L. Pflueger, 580 Market St., San Francisco, maternity wing addn. to hospital, **$350,000.**

★**Conn., Bristol**—Bristol Hospital, Inc., F. F. Barnes, pres., Newell Rd., plans completed by C. S. Palmer, 75 Whitney Ave., New Haven, brick, steel hospital addn. **$500,000,** incl. equip. $406,000 raised.

Conn., New Haven—Grace-New Haven Community Hospital, D. Spencer Berger, 135 Derby Ave., plans by D. Orr, 96 Grove St., brick, steel hospital unit. Over **$150,000.** Legal obstacles to be overcome.

Conn., Norwalk—St. Mary's Roman Catholic Parish, H. M. Callahan, 669 West Ave., plans by A. J. DePace, 151 W. 46 St., New York, N. Y., 16 room parochial school and convent, Chapel St. **$215,000.** Financing not provided. S. Shaw, 480 Lexington Ave., New York, N. Y., consult. engr. CD 1/31.

Conn., Southington—Bradley Memo Hospital, Meriden Ave., plans completed by W. Wilkins, 648 Asylum St., Hartford, brick, steel hospital, wing, Meriden Ave. **$250,000.** Financing not provided. Hubbard, Rickerd & Blakeley, 275 Orange St., New Haven, consult. engrs. CD 10/11—ENR 11/2.

★**Conn., West Hartford**—Norwood Estates, Inc., E. J. Naughton, pres., 648 Asylum Ave., Hartford, plans by W. Wilkins, 648 Asylum Ave., 300 homes, North Main and Mohawk Dr., Freeburg property, 125 acres. **$4,000,000.** Financing not provided.

Ga., Atlanta — Morningside Presbyterian Church, A. Y. Gibson, pastor, 1353 N. Morningside Dr. N. E., plans by Thomas & Wagoner, 1700 Walnut St., Phila., Pa., church, educational, scout and Sunday School bldgs. **$250,000.** Site purchased.

Ill., DeKalb—Anderson Theatre Circuit, F. W. Anderson, 118 E. Jefferson St., Morris, brick, glass and stone motion picture theatre, to be known as the Moderne. **$150,000** with equip. Site obtained.

Ill., LaSalle—L & P Theatres, Inc., P. N. Hurt, genl. mgr., Alger Theatres, 225 Gooding St., plans nearing completion by Rapp & Rapp, 230 N. Michigan Ave., Chicago, 1,200-seat motion picture theatre, 620-632 First St. **$150,000** plus equip.

★**Ind., Fort Wayne**—Sacred Heart Minor Seminary, Most Rev. J. F. Noll, Bishop, Fort Wayne, Roman Catholic Diocese, 1222 S. Clinton St., plans by W. J. Vandermeer, Aurora, 4 story, bsmnt. Roman Catholic Seminary, brick, rein.-con., steel, Auburn Rd. **$500,000.** CD 2/8

La., Alexandria—Sisters of the Incarnate Word. Alexandria, plans by Chas. F. Roberts, Guaranty Bank Bldg., 4 story, bsmnt., brick, concrete, tile 150-bed hospital, **$300,000.**

POSTWAR PROJECTS (Cont'd.)

★ **La., New Orleans**—W. Gruber, 1239 St. Charles Ave., plans by A. Perez, Jr., Audubon Bldg., Skyliner Ballroom. **$500,000.**

Me., Portland—Enterprise Realty Corp., 479 Hancock St., Quincy, plans by Sumner Rehein, 133 Washington St., Boston, Mass., brick, steel department store, Brown and Free Sts. **$250,000.** Financing not provided.

★ **Md., Baltimore**—Catholic Archdiocese of Baltimore, 408 North Charles St., plans by Murphy & Locraft, 1413 H St. N.W., Wash., D. C., boy's high school. **$1,000,000.** Financing not provided.

★ **Md., Baltimore**—Loch Hill Co., Munsey Bldg., plans by L. A. Menefee, Morris Bldg., one hundred thirty-five 2 story, bsmnt., brick or stone, residences, Loch Raven Blvd. and Register Ave. **$800,000.**

Md., Chevy Chase—Chevy Chase Ward of Washington Mormon Church, A. H. Cannon, Ward Bishop, 6803 Clarendon Rd., Edgemere, sketches by Gilbert Stanley Underwood, Federal Works Bldg., Wash., D. C., stone, concrete, steel church. **$200,000.**

★ **Mass., Boston**—New England Deaconess Hospital, 16 Deaconess Rd., plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., 5 story, bsmnt., brick, steel, stone hospital addn., concrete fdn. **$1,500,000.** Financing not provided.

Mass., Palmer—St. Anne's Memorial Church, Rev. T. A. Beauregarde, Main St., Three Rivers, plans completed by A. J. Roy, 22 Elm St., Worcester, 2 story, bsmnt., 80x127 ft., concrete, limestone and granite church. To exceed **$150,000.** Financing not provided.

Mass., Westfield—St. Mary's Parish, J. P. Kirby, pastor, plans by W. F. Phillips, 98 Congress St., Milford, brick, steel, concrete Donovan Memorial Gymnasium. **$150,000.**

★ **Mass., Worcester**—Trustees Assumption College, Rev. R. Martel, pres., Assumption St., plans by A. J. Roy, 22 Elm St., combination auditorium and gymnasium over $150,000; power plant over **$50,000;** convent and chapel, over **$150,000;** dining hall, over $150,000; athletic field, over **$50,000,** all on Burncoat St. Financing not provided. CD 11/30—ENR 11/30.

Mass., Worcester—Trustees Assumption College, R. R. Martel, pres., 5 Assumption Ave., plans completed by A. J. Roy, 22 Elm St., 2 story, bsmnt., 60x225 ft., concrete, brick, stone administration bldg., Burncoat St. **$250,000.** Financing not provided. CD 11/30—ENR 11/30.

★ **Minn., Rochester**—Kahler Corp., Rochester, plans 50% completed by Ellerbe & Co., 100 First Avenue Bldg., Rochester, 21 story, stone, faced brick hospital, 3 Ave. SW., W. Center St. to 1 St. SW. **$6,000,000.** CD 8/6/43—ENR 8/24/64.

Minn., St. Paul—Breck School for Boys, C. H. DesRochers, 2477 Como Ave., plans by Ellerbe & Co., 1021 E. First National Bank Bldg., 3 story, rein.-con., brick school activities bldg., near Como Ave. **$150,000.**

Minn., St. Paul—St. Paul Hotel, R. L. Kronstedt, mgr. dir., Fifth and St. Peter Sts., plans by Ellerbe & Co., 1021-E First National Bank Bldg., 11 story, rein.-con., brick hospital, **$400,000.** CD 2/13.

Minn., St. Peter—Gustavus Adolphus College, E. M. Carlson, pres., St. Peter, plans by Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, library. **$200,000.**

Mo., University City (br. St. Louis)—St. Louis Archdiocese of The Catholic Church, c/o Most Rev. J. J. Glennon, 4510 Lindell Blvd., St. Louis, Zone 8, plans 80% completed by Carroll & Dean, R. A. Long Bldg., Kansas City, Mo., and Chase Hotel, Lindell and Kingshighway Blvds., St. Louis, Zone 8, 2 and 3 story, brick, rein.-con., stone high school, Olive St. road east of Pennsylvania Ave. **$300,000-$400,000.** Funds available. CD 11/9—ENR 11/30.

N. H., Bedford—Bedford Academy, Bedford, sketches by Hudson & Ingram, 9 Buell St., Hanover, rebuilding school bldgs. To exceed **$150,000.** Financing not provided.

N. H., Concord—Eagle Hotel, 110 North Main St., plans by Lyford & Magenau, 3 North St., remodeling 2 story, bsmnt., concrete, brick hotel, **$150,000.** Financing not provided.

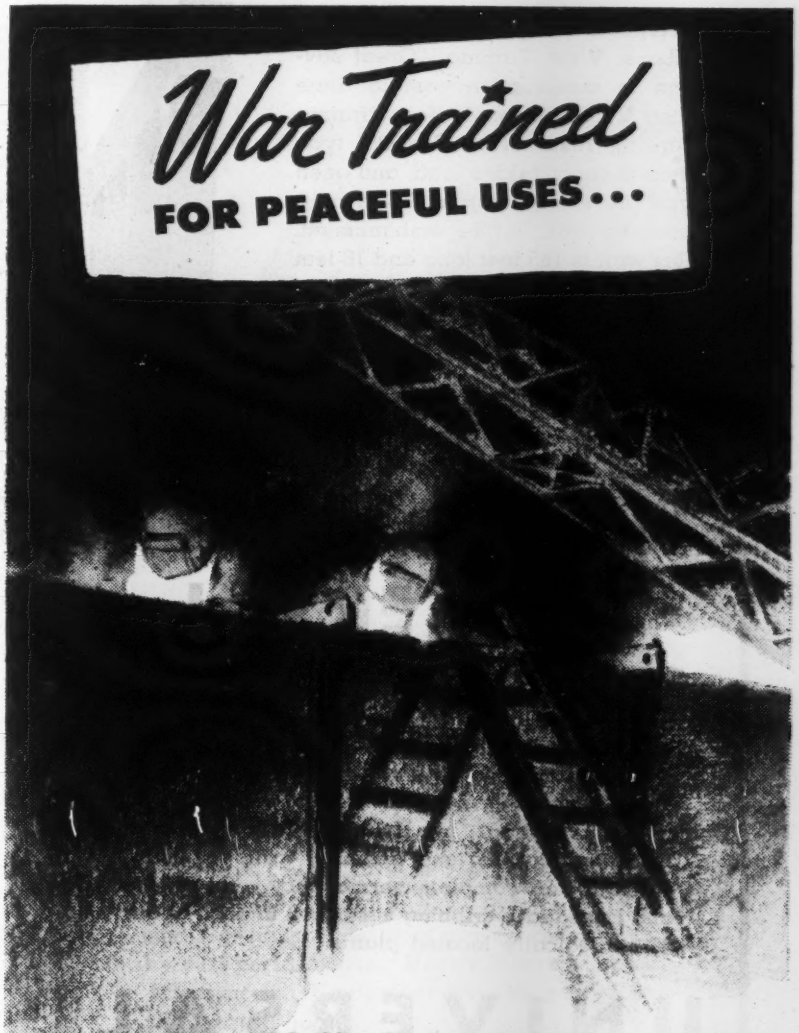
N. H., Lebanon—Veterans of Foreign Wars & American Legion, Lebanon, sketches by Hudson & Ingram, 9 Buell St., Hanover, concrete, brick bldg. To exceed **$150,000.** Financing not provided.

N. J., Midland Park—The Christian School, Midland Park, plans by C. K. Kovel, 119 Rock Rd., Glen Rock, school. **$150,000.**

★ **N. J., Plainfield**—Muhlenberg Hospital, Park Ave., plans under way brick, steel hospital. **$1,100,000.** Raising funds.

★ **N. C., Salisbury**—Catawba College, Salisbury, plans by Chas W. Benton & Sons, Wilson, expan. program, incl. library, auditorium, chapel, men's dormitory, gymnasium, science bldg. and swimming pool. **$1,000,000.** Financing not provided. CD 2/24/44—ENR 3/9/44.

★ **O., Cincinnati** — Bethesda Hospital, Reading Rd. and Oak St., plans by Sam Hannaford & Sons, Dixie Terminal, 7 story nurses' home and educational bldg. **$500,000.** CD 11/9—ENR 11/30.



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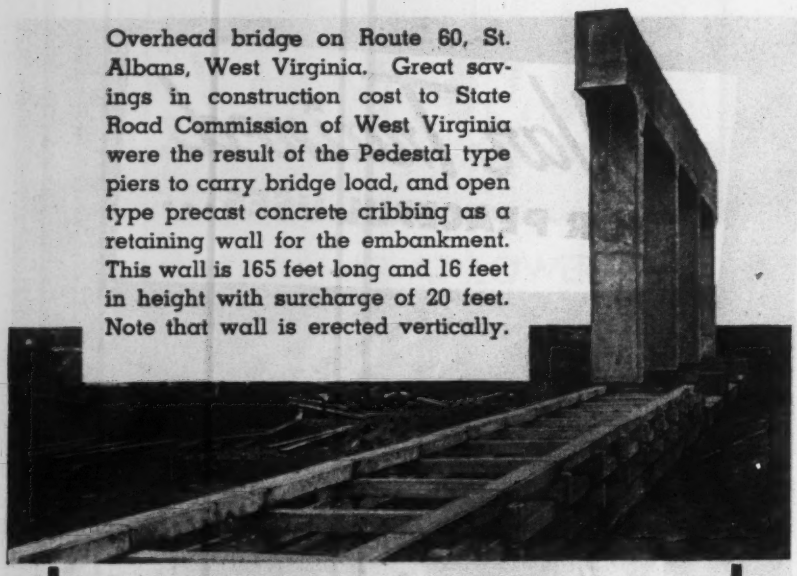

Overhead bridge on Route 60, St. Albans, West Virginia. Great savings in construction cost to State Road Commission of West Virginia were the result of the Pedestal type piers to carry bridge load, and open type precast concrete cribbing as a retaining wall for the embankment. This wall is 165 feet long and 16 feet in height with surcharge of 20 feet. Note that wall is erected vertically.

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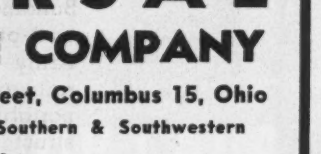


THE BYERS MACHINE COMPANY

RAVENNA, OHIO

DISTRIBUTORS THROUGHOUT THE WORLD

POSTWAR PROJECTS (Cont'd.)

★**O., Cincinnati**—Christ Hospital, Auburn Ave., plans by Tietig & Lee, 34 W. 6 St., 10 story hospital annex, $1,500,000. Fosdick & Hilmer, Union Trust Bldg., mechanical engr.

★**O., Cincinnati**—Sears Roebuck Co., 2900 Reading Rd., plans by Simmons, Carr & Wright, 333 N. Michigan Ave., Chicago, Ill., 3 story, bsmnt., brick, steel store addn. $1,000,000.

★**Pa., Phila. and Cheltenham**—C. Metz, 8014 Ogontz Ave., Phila., plans 75% completed residential developments, $500,000. Financing provided.

★**Pa., Phila.**—Boardman Smith Corp., 1322 Airdrie St., plans 40% completed residential developments, $500,000. Financing provided.

Pa., Phila.—L. Braeunig, Jr., 5126 N. 5 St., plans 20% completed residential developments, $250,000. Financing provided.

Pa., Phila.—Castor Highland Development Corp., 1616 Olney Ave., plans 50% completed residential development, $250,000. Financing provided.

Pa., Phila.—Conwell Memorial Church of Baptist Temple, Rev. G. R. Sweet, pastor, Lowber and Mohican Sts., preliminary surveys started by G. Ketterer, Archhitects Bldg., church, $175,000-$250,000. Financing not provided.

Pa., Phila.—Conwell Memorial Baptist Church, Tyson and Roland Sts., Rev. R. N. Deremer, pastor, 4726 Marple Ave., preliminary surveys started by G. Ketterer, Architects Bldg., church, $175,000-$250,000. Financing not provided.

Pa., Phila.—Cottage Realty Co., 230 S. Hanson St., plans 50% completed residential development, $300,000. Financing provided.

Pa., Phila.—George Edel & Sons, Inc., 416 E. Slocum St., plans 10% completed residential developments, here and in Erdenheim, Montgomery Co. $250,000. Financing provided.

★**Pa., Phila.**—Erny & Nolan, Bouvier St. and Cheltenham Ave., plans 50% completed residential developments, $500,000. Financing provided.

Pa., Phila—Grace Baptist Temple, Dr. D. A. Poling, pastor, Broad St. and Montgomery Ave., plans 10% completed by Gustav Ketterer & Co., Architects Bldg., rebuilding temple. $250,000. Partly financed.

Pa., Phila.—P. J. & T. P. McFarland, 2409 E. Allegheny Ave., plans 40% completed residential development, $250,000. Financing provided.

★**Pa., Phila.**—Nelson-Redley, Inc., 12 S. 12 St., plans 60% completed residential developments, here and in Montgomery and Delaware Counties. $500,000. Financing provided.

★**Pa., Phila.**—A. P. Orleans & Co., 100 W. Rockland St., plans 50% completed residential development, $500,000. Financing provided.

Pa., Selinsgrove—Susquehanna University, c/o Bldgs. & Grounds Comn., plans by Lawrie & Green, 231 North Front St., Harrisburg, class room bldg. $200,000.

R. I., East Providence—Riverside Congregational Church, Rev. R. C. Marriott, 15 Oak Ave., plans by Howe & Prout, 1016 Turks Head Bldg., Providence, brick, stone church and parish house, concrete fdn., Oak Ave. $150,000. Financing not provided. CD 2/8—ENR 3/8.

S. C., Spartanburg—Silvers 5 and 10 Cent Stores, Inc., R. Laroche, mgr., Spartanburg, plans under way rebuilding store destroyed by fire. $150,000.

Tex., Abilene—Hendrick Memorial Hospital, Abilene, plans 50% completed by Highes & Olds, 158½ Cypress St., 3 story, bsmnt., 40x168 ft. nurses' home. $160,000. Financing available. CD 1/29—ENR 2/1, under Commercial.

★**Tex., Dallas**—St. Pauls Hospital, 2121 Bryan St., Dallas, plans 10% completed by Thos. D. Broad, consult. archt., Burt Bldg., hospital wing or annex, $500,000. Funds available. CD 1/10—ENR 1/25.

Tex., Dallas—Trinity Presbyterian Church, 104 E. 10 St., plans completed by G. Gill, Great National Life Bldg., church. $150,000. Financing not provided. CD 7/21—ENR 8/10.

★**Tex., Dallas**—Sears, Roebuck & Co., 1409 S. Lamar St., Dallas, and W. Arthington and S. Homan Sts., Chicago, Ill., plans by Geo. L. Dahl, Southland Life Annex Bldg., and Owner's Architectural Dpt., 3 story, bsmnt. department store, $1,750,000; asphalt paving approx. 1 city block for parking area, $60,000. Financing available.

Tex., Houston—R. C. West & Associates, Plaza Hotel, plans 25% completed 1 story, 160x225 ft., brick, hollow tile, concrete community center, $200,000. Site purchased.

★**Wash., Seattle**—J. M. Colman, Colman Bldg., 1 and Marion Sts., Zone 4, plans under way by R. Durham, 4th and Cherry Bldg., Zone 5, remodeling Colman ferry terminal and adjoining Canadian National dock. $500,000.

Wash., Seattle—University Congregational Church, E. 43 St. and Brooklyn Ave., Seattle, Zone 5, plans by J. P. Jones, Hoge Bldg., Zone 4, church, 16 Ave. N.E. and E. 45 St. $150,000. Financing not provided. CD 5/26/43—ENR 6/17/43.

STWAR PROJECTS (Cont'd.)

Ont., Leamington—Lyons Club, F. R. Greg-, chn., Leamington, plans by J. C. Pen-gton, Canadian Bank of Commerce Bldg., elliett Ave., Windsor, hospital. Over 0,000.

P.E.I., Charlottetown—Owner, c/o E. S. anchard, archt., Cameron Block, medical nter or polyclinic bldg., with offices above. 0,000.

P.E.I., Charlottetown — Young Men's hristian Assn., Charlottetown, plans by S. Blanchard, Cameron Block, Charlotte-wn, Y. M. C. A. bldg. **$150,000.**

EADY FOR BIDS

N. Y., New York—Stuyvesant Town Corp., F. H. Ecker, pres., 1 Madison Ave., Zone plans completed by R. H. Shreve, ch. cht., Bd. Design, c/o owner, housing, mprising of 35 fireproof apartment bldgs. nging in height from 10 to 13 stories and 1 story garage housing 3,000 automobiles, 67 acre site bounded by First Ave., 14 Avenue C, East River Dr. and 20 St. 4,467,784. CD 4/19—ENR 5/4.

Tex., Dallas—R. Woods Auto Co., 2100 ms St., plans completed by H. K. Smith, 24 N. Versailles St., 2 unit auto display d sales bldg. **$350,000.** Funds available. D 11/22—ENR 12/14.

Tex., Houston—F. Sharp, 2407 Stanmore Dr., plans completed one hundred fifty story, brick veneer, dwellings, concrete ns. **$1,250,000.** Funds available.

Tex., San Angelo—Sacred Heart Church, n Angelo, plans completed by Phelps & eWees & Simmons, 1615 Majestic Bldg., n Antonio, school. **$150,000.** Financing vailable. CD 1/31.

Tex., San Antonio—St. Gerard Church, 17 Iowa St., plans completed by Phelps & eWees & Simmons, 1515 Majestic Bldg., unior-Senior High School. **$150,000.** Financ-g provided. CD 1/25—ENR 2/8.

ONTRACTS AWARDED

D. C., Wash.—Julius Garfinckel & Co., C. Sheffield, pres., 1417-1419 F St., 9 story epartment store addn., to Charles H. Tomp-ns Co., 907 17 St. N.W. Porter & Lockie, etropolitan Bank Bldg., archts.

N. Y., New York—A. Campagna, 654 Madison Ave., Zone 21, 12 story apart-ent, 61 Washington Square. Owner builds. **,000,000.** R. Candela, 110 E. 42 St., Zone 7, archt.

R. I., Pawtucket—Charles H. Lawton & Son and A. H. Skackleton, 210 Main St., bout eighty-five 100x100 ft., single resi-ences, Alexander McGregor Rd. and Narra-nsett Ave., separate contracts. **$400,000-00,000.** Financing not provided.

INDUSTRIAL BUILDINGS

ROPOSED WORK

Calif., Antioch — FACTORY — Glass Con-iners, Inc., Russ Bldg., San Francisco, lass factory.

Calif., Berkeley—FACTORY—Kaiser Car-, Inc., and Stanley Hiller, Jr., Richmond, elicopter factory.

Calif., Oakland—WAREHOUSE, etc.—State lectric Supply, 241 10 St., 2 story ware-ouse and office bldg. **$100,000.**

Calif., Oakland—PLANT—Loose-Wiles Biscuit Co., 851 81 Ave., plant addn. 00,000.

Calif., Oakland—PLANT—Mother's Cake Cookie Co., E. 18 St. and 12 Ave., plant. 00,000.

Calif., Oakland — PLANT— Pepsi-Cola Co., 3521 Chestnut St., syrup mfg. plant. 00,000.

Calif., Oakland — PLANT — Teagarden roducts Co., 755 Sansome St., San Fran-co, food-processing plant.

Calif., Oakland—PLANT—Western Neon orp., 3001 Chapman St., plant. **$50,000.**

Calif., Richmond—PLANT—Eastman Tag & Label Co., 548 4 St., San Francisco, tra-modern plant. **$500,000.**

Calif., Richmond—PLANT—Richmond In-dependent, 202 10 St., 2 story, 100x200 ft., ein.-con. bldg.

Calif., Salida—LABORATORY—Shell Oil Co., Inc., Shell Bldg., San Francisco, ricultural laboratory. **$500,000.**

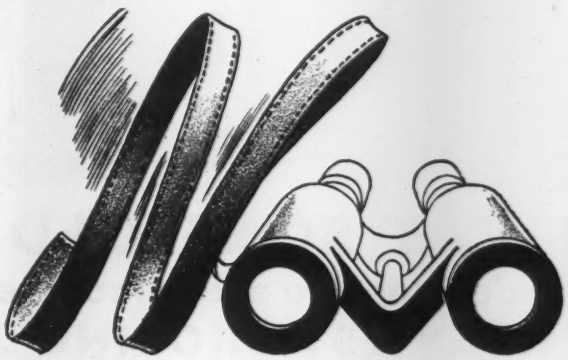
Ill., Chicago — WAREHOUSE — Socony acuum Oil Co., 59 E. Van Buren St., 1 ory, 150x600 ft., brick, rein.-con. ware-ouse.

Ind., Gary—PLANT—United States Steel Corp., Gary, altering, repairing steel ant, blast furnaces, bridge and structural eel fabricating plant, equip., etc. **$50,-00,000.**

N. J., Newark—BREWERY—Anheuser-Busch, Inc., 721 Pestalozzi St., St. Louis, Mo., preliminary sketches completed rewery on approx. 18 acre site recently urchased. **$1,000,000.**

N. Y., Buffalo—SERVICE STATION—ambleton Terminal Corp., Buffalo, service tation, Main and North Sts. Over **$50,000.**

LOOK TO THE FUTURE



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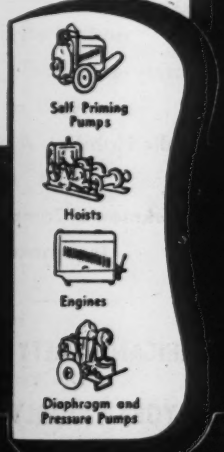
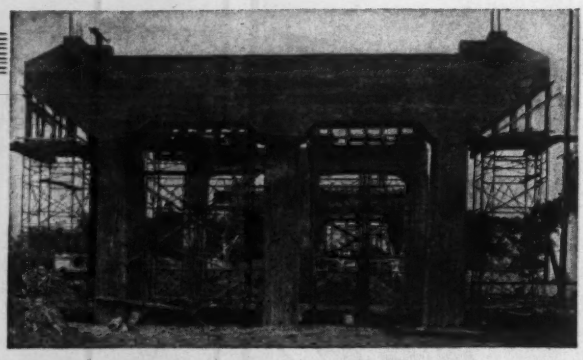


NOVO ENGINE CO.



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POSTWAR PROJECTS (Cont'd.)

★**O., Cincinnati**—**FEED MILL**—Southern States Co-Operative, W. G. Wysor, gen. mgr., Insurance Bldg., Richmond, Va., addnl. storage and feed mfg. facilities, concrete grain elevator, warehouses and car shed, $750,000.

Ore., Medford and Salem—WAREHOUSES—Pacific Cooperative Poultry Producers Assn., c/o G. C. Keeney, 306 S. E. Ash St., Portland, rein.-con. warehouses at Medford and Salem. $50,000. Financing provided.

★**Tex., Lubbock**—**REFINERY**—American Crystal Sugar Co., Dr. A. W. Skuderna, Boston Bldg., Denver, Colo., sugar beet refinery plant, $2,000,000. Funds available.

★**Wis., Milwaukee**—**OIL TERMINAL**—Shell Oil Co., Inc., 624 S. Michigan Ave., Chicago, Ill., leased land on Jones Island from Bd. Harbor Comrs., City Hall, to construct Marine oil terminal (10,000,000 gal. capacity in 6 large and 3 small storage tanks) incl. office bldg., garage and warehouse. $500,000.

B. C., Victoria—**PLANT**—H. R. McMillan Interests, Victoria, exten. cold storage plant, $75,000; cannery near present cold storage plant, $100,000.

Man., Winnipeg — **PLANT** — Kipp Kelly Ltd., 69 Higgins Ave., plant addn. $45,000.

N. B., Andover—**CREAMERY**, etc.—Syndicate, c/o Warden Moore, Andover, creamery, etc. $40,000.

Ont., London — **PLANT** — Empire Brass Mfg. Co., Ltd., Dundas St. E, plant addn. About $100,000.

Ont., Milton—**PLANT**—P. L. Robertson Mfg. Co., Ltd., Milton, plant exten. $50,000 or more.

★**Ont., Moose River**—**PULP MILL**—Syndicate, c/o Northern Ontario Associated Bd. Trade, North Bay, pulp mill at the mouth of Moose River. Over $500,000.

Ont., Moosonee — **CANNERY** — Syndicate, c/o N. O. Associated Bd. Trade, North Bay, fish cannery, $40,000; fast freezing unit, $40,000.

Ont., Owen Sound — **FACTORY** — Dalton Keeling, Inc., 1183 E. 16 St., plans factory, $40,000.

Ont., Port Arthur—**PLANT**—Can. Lakehead Exhibition, Inc., c/o Capt. S. Ward rope, Port Arthur, refrigeration plant, $40,000.

Ont., Preston—**FACTORY**—K. Graham, 1030 Vine St., factory. $40,000. Site purchased.

Ont., Renfrew—FACTORY—Renfrew Machinery Co., Ltd., Renfrew, site purchased for factory. $75,000.

Ont., St. Mary's—**PLANT**—C. Richardson & Co., Ltd., St. Mary's, dairy equip., etc., mfg. plant. $40,000.

Ont., Strathroy—**FACTORY**—Somerville, Limited, G. Hobart, genl. mgr., Dundas and Adelaide Sts., London, factory addn. $100,000.

Ont., Toronto—**PLANT**—Acme Carbon & Ribbon Co., Ltd., 260 W. Richmond St., plant exten. $40,000.

Ont., Toronto—**PLANT**—Don Juan Canada Ltd., 74 W. Wellington St., cosmetics mfg. plant, etc. $40,000.

Ont., Toronto—**PLANT**—Murphy Paint Co. Ltd., Lake Shore Rd., purchased 5¼ acre site near Browns Line for factory, $400,000.

Ont., Toronto—**PLANT**—Photographic Reproduction Co., Ltd., c/o H. P. Green, 77 Bay St., plant. $50,000.

Ont., Toronto—**PLANT**—The Boake Mfg. Co., Ltd., 7 Dartnell Ave., lumber products plant exten.

Ont., Toronto—**PLANT**—The Ontario Paint & Varnish Co., Ltd., 268 Pape Ave., plant exten.

Ont., Toronto—**PLANT**—Union Felt Products, Ltd., c/o B. A. Himel, 1 Wiltshire Ave., cotton, wool, layer felts mfg. plant addn. $40,000.

Que., Limoilou (Postal District Quebec City)—**FACTORY**—R. Pettigrew, 377 St. Cyrill St., Quebec City, factory. $50,000.

Que., Montreal—**FACTORY**—Loma Mfg. Co., Ltd., c/o H. Batshaw, 276 W. St. James St., factory, $40,000.

PLANS UNDER WAY

★**Calif., Vernon**—**PLANT**—Aircraft, Inc., c/o Austin Co., consult. engr., 777 E. Washington Blvd., Los Angeles, plans unit-way 1 and 2 story, rein.-con., brick, steel printing plant, sprinkler sys., partly air conditioned. Over $1,000,000.

Conn., East Hartford—**LOCKER PLANT**—H. E. Bidwell, 68 Naubuc Ave., plans C. F. Gifford, 16 Elm St., 1 story, basement, 45x100 ft., frozen food locker plant, $40,000. Financing provided.

Conn., Hamden—**FACTORY**—Wire Rope Corp. of America, 464 Congress Ave., New Haven, preliminary plans factory expansion incl. wiredrawing plant, rope making plant, office, warehouse and cafeteria. State $1,000,000. Over $40,000. Financing not provided. L. P. Caproni, 1221 Chapel St., New Haven, consult. engr.

Kan., Dodge City—WAREHOUSE—D. C. Nevins Implement Co., Dodge City, plans by A. R. Mann Co., Wiley Bldg., Hutchinson, brick, concrete implement warehouse. $40,000.

POSTWAR PROJECTS (Cont'd.)

Mass., Norwood—GARAGE—L. Balboni, 716 Neponset St., plans by H. J. Korslund, 644 Nahatan St., garage addn., remodeling. To exceed. $40,000.

Mich., Detroit—SLAUGHTERHOUSE—S. Loewenstein & Son, 1945 Adelaide St., plans under way slaughtering-rendering plant, brick, steel, concrete. Approx. $250,000.

Mo., Columbia — PLANT — State Dairy Products Co., 203 S. 8 St., plans by W. D. McCormick, Columbia, plant. $90,000.

N. J., Irvington—STORAGE—Grossman Paper & Bag Co., 603 S. 31 St., plans by Wm. E. Lehman, 972 Broad St., Newark. 1 story, 54x158 ft. storage bldg. addn. $45,000.

N. J., Long Branch—FACTORY—Martin Rubber Co., 51 Long Branch Ave., plans under way 1 story, 50x200 ft., hollow tile, steel, factory addn. $45,000 or more.

N. J., Newark—FACTORY—Royal Plating Co., 158 Bleecker St., plans by B. Cirlinciona, 222 S. Orange Ave., 1 story, brick, concrete factory addn. Over $40,000.

N. J., Ridgefield Park—TRUCKING DEPOT—Werner Trucking Co., 17 Paulson Ave., plans under way 200x200 ft. trucking depot, $170,000.

N. J., Rutherford—GARAGE—T. McKenna, c/o Huesmann & Osborne, archts., 13 Orient Way, 1 story, 50x150 ft. garage. $50,000.

O., Hamilton—BUS TERMINAL—Ohio Bus Line Co., M. Edwards, vice-pres., 1930 Central Parkway, tentative plans by C. F. Cellarius, 111 4 St., Cincinnati, bus terminal, High St. near Third St. $250,000. Legal obstacles to be overcome.

O., Newark—FACTORY—Pharis Tire & Rubber Co., Newark, plans under way factory addn. $75,000. Legal obstacles to be overcome.

O., Newark—PLANT—Sears, Roebuck & Co., W. Arthington and S. Homan Sts., Chicago, Ill., plans under way remodeling, building program for plant of Newark Stove Co., Newark. $750,000.

O., Oberlin—FACTORY—Millcraft Paper Co., H. W. Keil, pres.-secy., 1937 E. 19 St., Cleveland, sketches 1 story, 50x250 ft., brick, steel factory, $50,000. Financing provided. A. J. McKee & Co., 2300 Chester Ave., Cleveland, engrs.

Ore., Eugene—FEED MILL, etc.—Pacific Cooperative Poultry Producers' Assn., c/o G. C. Keeney, 306 S.E. Ash St., Portland, plans by Jones-Hettelsater Constr. Co., 1012 Baltimore St., Kansas City, Mo., feed mill and warehouse, rein.-con. $175,000. Financing provided.

Pa., Towanda — FACTORY — Sylvania Electric Products, Inc., W. Zimmer, mgr., Emporium, plans by C. Wagner, 133 W. 4 St., Williamsport, brick, steel plant, laboratory and warehouse. $80,000.

Tex., Houston—PLANT—National Vinegar Co., 520 Pine St.; plans 25% completed vinegar mfg. plant, $100,000. Funds available.

Tex., Houston—PLANT—Quality Beverage Co., 1015 Sampson St., plans 10% completed plant mfg. unit. $90,000. Financing available.

Tex., San Antonio—WAREHOUSE—Ben Mindes, 201 N. Alamo St., plans 50% completed by Smith, Pitts & McPherson, Alamo National Bldg., 6 unit, hollow tile, concrete, brick warehouse, $100,000. Matthews & Kenan, 1615 Transit Tower Bldg., consult. engrs. CD 10/27—ENR 11/16.

Ont., Kingston—PLANT—Canadian Industries, Ltd., C. I. L. House, Montreal, Que., preparing plans exten. nylon yarn plant. About $200,000.

READY FOR BIDS

Conn., East Hartford—BAKERY—Regan Bakeries, 1022 Main St., plans completed by Kane & Fairchild, 49 Pearl St., Hartford, brick, steel bakery, Main and Pitkin Sts. $50,000.

Ill., Rock Island—GARAGE, etc.—Edwards Bros., 530 20 St., plans completed by R. C. Sandberg, Rock Island Bank and Trust Bldg., 1 story, steel, concrete garage and salesroom. $80,000.

N. J., Passaic—MARKET—68-70 1st St. Corp., 64 1 St., plans completed by A. Shulman, 262 Main St., Paterson, 2 story fruit and produce market, brick. $50,000 plus.

N. J., Summit—WAREHOUSE—Aircraft Parts Development Corp., 409 Broad St., plans completed warehouse. $50,000. CD 12/15—ENR 12/28.

Ont., Toronto—PLANT—George Weston, Ltd., 124 Peter St., plans completed exten., mprv. biscuit mfg. plant. $100,000.

Ont., Woodstock—PLANT—Canada Cas-ers, Ltd., Woodstock, made plans plant ddn. accommodating tool and die making ept. $50,000.

Que., Bedford—PLANT—The Torrington Co., Ltd., Bedford, plans prepared doubling apacity of needle bearings mfg. plant. 50,000.

CONTRACTS AWARDED

Conn., Springdale — PLANT — Machlette Laboratories, Inc., J. A. Lambert, pres., 963 Hope St., brick plant addn., Camp Ave. nd Hope St., to W. J. Barney Corp., 101 Park Ave., New York, N. Y. Est. $50,000.

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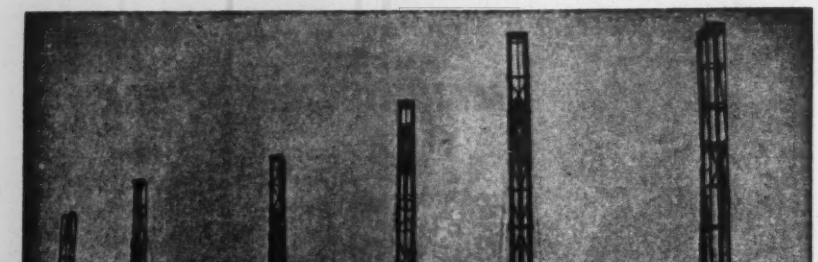

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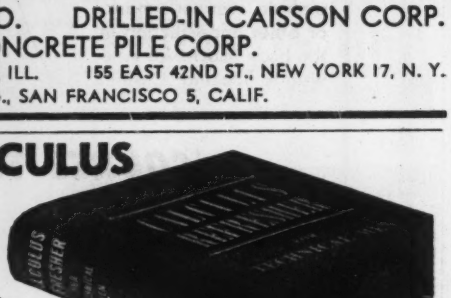

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POSTWAR PROJECTS (Cont'd.)

PROJECTS CANCELLED

★**Tex., Lufkin**—PLANT—Southland Paper Mills, Inc., E. L. Kurth, pres., Lufkin, project cancelled auxiliary paper pulp mfg. plant, **$2,500,000.** CD 3/4/43—ENR 3/18/43.

ADVANCED TO ACTIVE STATUS

★**Fla., Sarasota**—POWER PLANT—Florida Power & Light Co., Ingraham Bldg., Miami, project cancelled, power plant, near here. **$2,000,000.** Work now going ahead. H. V. Street, c/o owner, engr. CD 11/16—ENR 11/30.

UNCLASSIFIED

PROPOSED WORK

Calif., Fresno—PLAYGROUND, etc.—City, City Hall, developing Romaine playground, recreational center bldgs., 2 swimming pools, **$125,000.** CD 9/8—ENR 9/21.

Calif., Fresno—STREET LIGHTING—City, City Hall, street lighting extens. **$425,000.** CD 9/8—ENR 9/21.

Calif., Hollister—FIRE ALARM SYSTEM—City, City Hall, fire alarm sys. **$40,000.**

★**Calif., San Francisco**—AIRPORT—City and San Francisco Co., City Hall, first postwar year, Proj. 501, airport development, **$1,500,000;** five following years, Proj. 501, airport development, **$18,000,000,** for San Francisco Airport, South San Francisco. CD 3/18/43—ENR 3/25/43.

★**Calif., San Francisco** — AMUSEMENT CENTER—E. N. Fritz, 1100 Sacramento St., amusement center, incl. arena, ballroom, bowling alleys, ice rink, television station. **$1,250,000.**

★**Calif., San Francisco**—PLAYGROUNDS, FIELDHOUSES, etc.—City and San Francisco Co., City Hall, first postwar year Proj. 1314, Folsom playground **$14,000,** Proj. 1338, Eureka Valley playground **$77,380,** Proj. 1339, Upper Noe Valley Playground **$111,066,** Proj. 1306, St. Mary's Playground **$52,824,** Proj. 1309, Longfellow Playground **$40,725,** Proj. 1342, Chinese Center **$121,078,** Proj. 1301, 15 St. Fieldhouse **$12,500,** Proj. 1322, North Beach Convenience Station **$8,000,** Proj. 1328, Jas. D. Phelan Beach development **$159,474,** Proj. 1352, Michelangelo fieldhouse **$10,800;** five following years Proj. 1339, Upper Noe Valley completion **$88,447,** Proj. 1326, North Beach Center **$229,700,** Proj. 1343, Mission Center **$166,356,** Proj. 1356, Visitacion Valley Playground Fieldhouse **$22,268,** Proj. 1303, Corona Heights **$126,050,** Proj. 1305, Silver Terrace **$84,770,** Proj. 1354, Excelsior Playground **$50,880,** Proj. 1312, Burnett Playground **$274,000,** Proj. 1348, Crocker-Amazon Fieldhouse **$130,200,** Proj. 1315, North Beach Flood Lighting Sys. **$18,000,** Proj. 1318, Bernal Playground **$9,010,** Proj. 1331, Margaret S. Hayward Playground **$95,146,** Proj. 1311, Grattan Playground **$158,400,** Proj. 1313, Sunset Playground Fieldhouse **$103,167,** Proj. 1313, Potrero Hill Fieldhouse **$160,680,** Proj. 1302, Wawona Fieldhouse **$21,000,** Proj. 1317, Hamilton Playground **$222,329,** Proj. 1349, Helen Wills Center **$7,240,** Proj. 1341, James Rolph, Jr. Center **$7,240,** Proj. 1324, Ocean View **$21,200,** Proj. 1330, Day Camp **$82,535;** Proj. 1337, Hayes Valley Center **$163,500;** Proj. 1466, McLaren Park Imprvs. **$200,000,** Proj. 1461, Buena Vista Park imprvs. **$112,500,** for City Recreation Comn., City Hall Civic Center. CD 3/18/43—ENR 3/25/43.

★**Calif., San Francisco**—RAILWAYS—City and San Francisco Co., City Hall, first postwar year Proj. 401 reconstructing, repairing (part) railways, **$1,800,000;** five following years Proj. 401, reconstructing repairing (part) railways, **$3,700,000,** for City Municipal Railway, City Hall.

★**Calif., San Francisco**—STREET LIGHTING—City and San Francisco Co., City Hall, first postwar year, street lighting. Proj. 2101 Lombard-Van Ness to Richardson **$25,750,** Proj. 2102, Richardson, Lombard to Lyon **$6,500,** Proj. 2103, 3 St., 23 to Custer **$15,300,** Proj. 2104, Union Square **$11,000,** Proj. 2105, 3 St., Custer to Bayshore **$63,000,** Proj. 2107, Bayshore, Army to city limits **$69,300,** Proj. 2107, Potrero, Division to Army **$20,000,** Proj. 2108, O'Shaughnessy Blvd., Portola to Congo **$15,300,** Proj. 2109, Army, Harrison to S. Van Ness **$9,500,** Proj. 2110, 10 St., Market to Division **$3,500,** Proj. 2111, Army, S. Van Ness to San Jose **$11,500,** Proj. 2112, Fell St., Baker to Stanyan **$28,100,** Proj. 2113, Harrison, Embarcadero to 10 **$13,500,** Proj. 2114, San Jose Ave., Army to Brooks **$16,600,** Proj. 2115, Bryant St., 2 to 11 **$11,000,** Proj. 2117, Guerrero, Market to San Jose **$47,300;** five following years, Proj. 2116, 3 St., Market to Mission **$5,500,** Proj. 2118, 6 St., Market to Townsend **$12,500,** Proj. 2119, California, Market to Van Ness **$70,500,** Proj. 2120, California, 8 to 32 Ave. **$57,000,** Proj. 2121, 5 St., Market to Howard **$9,600,** Proj. 2122, 2 St., Market to Harrison **$23,300,** Proj. 2123, Sloat, Junipero Serra to Great Highway **$14,800,** Proj. 2125, Army, Potrero to Harrison **$4,300;** Proj. 2126, Folsom, Embarcadero to 10 **$13,500,** Proj. 2127, Geary St., Presidio to 42 Ave. **$105,600,** Proj. 2128, Pt. Lobos, 41 to Great Highway **$23,600,** Proj. 2129, Mission, Embarcadero to Beale **$11,000,** Proj. 2130, Junipero Serra, Sloat to city limits **$42,200,** Proj. 2131, Mission, S. Van Ness to city limits **$213,500,** Proj. 2132,

POSTWAR PROJECTS (Cont'd.)

19 Ave., Sloat to Junipero Ser. $9,000, Proj. 2134, Monterey, Ridgewood to San Anselmo $12,200, Proj. 2135, Alemany, Bayshore to Junipero Serra $99,000, Proj. 2137, Clarendon, Laguna Honda to Twin Peaks Blvd. $14,500, Proj. 2139, 3 St., Channel to Marions $24,400, for Pub. Utilities Comn., Bureau of Light, Heat & Power, City Hall. CD 1/22/43—ENR 3/25/43.

★ **Calif., San Francisco**—TRAFFIC SIGNALS, etc.—City and San Francisco Co., City Hall, first postwar year, Proj. 19, traffic signals, Lombard St., $21,000; Proj. 20, 19 Ave., $45,000; Proj. 34, walls, Monterey Blvd., $160,000, for Bureau Engineering, Hall of Justice.

★ **Calif., San Francisco**—ZOO—City and San Francisco Co., City Hall, Proj. 1438, reconstructing zoo, $500,000.

Conn., Danbury—RADIO STATION—Danbury Broadcasting Co., M. H. Peterson, expan. radio station broadcasting facilities. $25,000.

Conn., Hadlyme—PARK IMPROVEMENTS—State Park & Forest Comn., State Office Bldg., Hartford, imprv. exten. Gillette Castle State Park. $50,000. Financing not provided.

Ill., Chicago — POWER DISTRIBUTION SYSTEM—University of Illinois, 5750 S. Ellis St., Chicago, power distr. sys., Proj. 44, $480,000.

Me., Bath — SWIMMING POOL — Young Men's Christian Assn., Bd. Directors, D. Williams, 1068 Washington St., concrete swimming pool, $50,000. Financing not provided.

★ **Md., Baltimore** — HANGAR — City, City Hall, Hangar 2 at municipal airport, B. C. $750,000. Financing available. CD 10/21/43—ENR 10/28/43.

Mass., Everett—STADIUM—City, Mayor's Office, City Hall, concrete, steel municipal stadium. Over $100,000. Financing not provided.

★ **Mass., Waltham** — TELEVISION STATION—Ratheon Mfg. Co., Willow St., L. K. Marshall, pres., television station. $500,000. Financing not provided.

Minn., Tyler—AIRPORT—City, H. M. Alyer, clk., City Hall, voted $54,000 bonds, municipal airport. $50,000. CD 1/4—ENR 1/3.

Miss., McLaurin—AIRPORT—City, grading airport. $140,000. CAA will help finance.

Mo., Clayton (St. Louis, Zone 5 P. O.)—AIRPORT—City, A. H. Kerth, mayor, 10 North Bemiston St., $300,000 bond election Apr. 3, purchase land and development municipal airport on 82 acre tract west of Shaw Park on Brentwood Blvd. north of County hospital.

Mo., Clayton (St. Louis, Zone 5, P. O.)—TERMINAL, etc.—City, A. H. Kerth, mayor, 10 North Bemiston St., $150,000 bond election Apr. 3, transportation terminal and war memorial.

N. Y., Brooklyn—STADIUM—Bd. Higher Educ., 695 Park Ave., New York 21, N. Y., stadium, Brooklyn College, Bedford Ave. and Avenue H, Zone 10, Proj. HN-48, $270,000.

N. Y., New York—LANDING PLATFORM—Dpt. Marine & Aviation, Pier A, North River, New York 4, landing platform for excursion boats, W. 129 St., North River. $125,000.

★ **N. Y., New York**—PIERS—Dpt. Marine & Aviation, Pier A, North River, New York 4, plans Pier 82, D-182, $1,750,000; Pier 94, D-87, $1,500,000; Pier 26, D-105, $850,000; Piers 65, 69 and 70, $3,000,000; Piers 75, 77, and 80, D-93, $5,000,000, all foregoing on North River.

★ **N. Y., New York**—SLIPS—Dpt. Marine & Aviation, Pier A, North River, New York 4, 2 slips at E 134 St., Terminal, slip, dock, etc., at Riker's Island and one at North Brother Island, D-172. $600,000.

★ **N. Y., North Beach**—RUNWAYS, etc.—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, runways, D-102, $240,000; fill along Northerly side of Field, D-143, $750,000; bulkhead revetment along westerly and northerly outline of airport, D-103, $500,000, all at LaGuardia Field. CD 1/25/43—ENR 1/28/43.

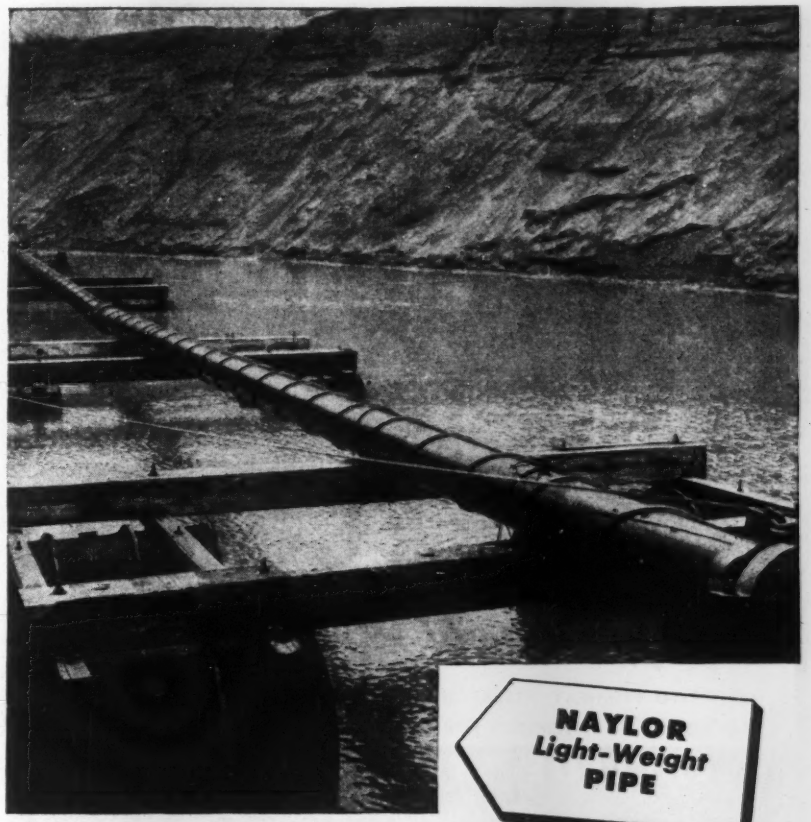
★ **Pa., Phila.**—STADIUM—Temple University, Dr. R. L. Johnson, pres., Broad St. and Montgomery Ave., stadium, $500,000-$1,000,000. Financing not provided. Site not purchased.

★ **South Carolina**—TRANSMISSION LINES—South Carolina Pub. Service Auth., Moncks Corner, electric transmission lines, throughout lower South Carolina, $7,000,000. Land rights not cleared, financing not provided.

Tex., Jasper—AIRPORT—Jasper Co., A. Turner, judge, Jasper, airport. $485,000. Financing not provided.

★ **Va., Newport News**—PARKS, etc.—City Council, City Hall, plans Huntington Park shelter, $15,000; East End Ball Park, $7,500; Colored Ball Park, $7,500; Colored Pleasure Pier, $25,000; Stuart Gardens Park, $300,000; swimming pool, Huntington Park, $35,000; casino Park, $250,000; 2 parking lots, $170,000. Financing not provided.

Wash., Bellingham—RUNWAY REPAIRS—Whatcom Co., Court House, repairing runways, at airport. $200,000. CAA to make survey.



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POSTWAR PROJECTS (Cont'd.)

Wash., Bremerton — PARK ENLARGEMENT—State Park Comn., Olympia, enlarging Illahee State Park, near here, incl. bathing beach, roads, bathhouses, tennis courts, etc. $50,000. Financing not provided.

Wash., Seattle—PIERS—Park Bd., 2334 4 Ave., 3 concrete fishing piers, $30,000.

Wis., Madison—BATHHOUSE, etc.—City, J. R. Law, mayor, City Hall, rebuilding bathhouse, Tenney Park, $11,500; club house, Monona Golf Course, $18,000; bituminous surfacing various parks, $12,000; bathing beach, E. Gorham St., $7,300; reconstructing Olin Park, $40,000. Financing not provided.

Wis., Madison—FIRE ALARM SYSTEM—City, J. R. Law, mayor, City Hall, exten. fire alarm sys., for Fire Dpt. $30,000. Financing not provided.

Wis., Madison — STREET LIGHTING — City, City Hall, street lighting on University St., $30,000; E. Washington St., $85,000; W. Washington St., $30,000; Regent St., $33,000. Financing not provided.

★**Man., Great Falls**—POWER DEVELOPMENT—Provincial Govt., Winnipeg, 350,000 hp. power development at Whitemud Falls on Nelson River. $25,000,000.

Man., Portage La Prairie—PARK BEAUTIFICATION — Municipality, beautification Island Park. $50,000.

Man., Winnipeg—SWIMMING POOLS, etc.—City, City Hall, swimming pools, playgrounds. About $200,000.

N. B., St. Croix—POWER DEVELOPMENT—New Brunswick Power Comn., Saint John, power development on St. Croix River, $250,000.

Ont., Brockville—RINK, etc.—Town, H. W. Carswell, clk., rink and community centre, $350,000.

Ont., Kirkland Lake—AIRPORT—Town, Post War Planning Com., C. V. Caswell, chn., municipal airport. About $75,000.

★**Ont., London**—UNDERGROUND ELECTRIC CIRCUITS—London Public Utilities Comn., E. N. Buchanan, genl. mgr., installing underground electric circuits, $200,000; street lighting, $200,000; high voltage transformer station, $325,000.

Ont., Sarnia—POWER LINES, etc.—Sarnia Hydro-Electric Comn., Sarnia, imprv. electric sys., incl. new power lines, etc. $120,000.

★**Ont., Toronto**—PARKING STATION, etc.—Municipality, underground parking station and garage, site bounded by Dundas, Queen, University Ave. and Bay St. $1,500,000.

★**Que., Montreal** — PARKING FACILITIES—Municipality, underground parking facilities, $1,000,000.

Que., Montreal—SUBWAY—Municipality, North-South Subway from Jean Talon to Craig St.; from Atwater Ave., to Amherst St.; Atwater Ave. to Sherbrooke St.

Que., Montreal—ZOO and AQUARIUM—Municipality, zoo and aquarium, $250,000.

PLANS UNDER WAY

★**California** — TRAMWAY—State, Beaches & Parks Div., State Office Bldg., Sacramento, aerial tramway from Palm Springs to summit of Mount San Jacinto, $1,360,000. Financing not provided. Modjeski & Masters, State St. Bldg., Harrisburg, Pa., consult. engrs.

Calif., Alameda—PARK IMPROVEMENTS, etc.—City, City Hall, imprv. Washington Park, bleachers, courts, etc., $30,000; Lincoln Park, $20,000; Longfellow Park, $5,500; Franklin Park, $7,500; reconstruct McKinley Park, $25,000; construct Krusi Park, $46,825; remodel corporation yard, $50,000; street lighting, $167,283; bleachers and football field, Alameda High School, $30,000; swimming pool at Alameda High School, $70,000; develop playgrounds at Porter School, $15,000; at Washington School, $3,000; at Maslick School, $4,000. C. Froerer, City Hall, city engr. CD 11/17—ENR 11/30.

Calif., Berkeley—LIGHTING SYSTEM, etc.—City, City Hall, underground fire alarm circuits, $125,000; cable renewal in Claremont Lighting Dist., $30,000; lighting sys., San Pablo Ave. from Virginia St. to North City limits, $25,500; Sacramento St. from Alcatraz to Hopkins St., $30,000; Grove St., from Adeline to Solano, $35,000; Dwight Way, College to San Pablo Ave., $28,000. H. Goodridge, City Hall, city engr.

Calif., Burlingame—PARKING LOT, etc.—City, City Hall, plans completed parking lot and service-alley, $80,000. Land rights not cleared, legal obstacles to be overcome and financing not provided. C. Longson, City Hall, city engr.

★**Calif., Long Beach** — AIRPORT — City, City Hall, $1,500,000 bond election May 8, expan. Long Beach Municipal Airport and provided protection to existing runways. G. E. Baker, City Hall, city engr. CD 12/6—ENR 12/28.

★**Calif., Los Angeles**—GOLF COURSES, etc.—City Park Dpt., City Hall, plans 75% completed 18- and 9-hole golf courses in Griffith Park, grading 160 acres, water and sewer lines, landscaping, etc., $228,920; golf club house in Griffith Park, $184,000; plans 50% completed 3,500 ft. roadway in Griffith Park to top of Mount Hollywood.

OSTWAR PROJECTS (Cont'd.)

arking for 300 cars at end of road, $132,- 00; retaining walls in connection with ew Hollywood roadway in Griffith Park, 23,223; street tree planting, trimming, etc., 76,667; plans 25% completed constructing, prv. park roads in Griffith Park, $608,730; reliminary plans under way development f 500 acres in Griffith Park, $268,895; con- ver planting of trees over 400 acres in riffith Park, contour ditches for irrigation, 30,350; recreational area development of ortion of area above Sepulveda Dam, tree lanting, grading, golf course, roadways, ater lines, club house, service bldgs., etc., 94,150; War memorial and observation ower 3 story, circular, 100 ft. diam. re- olving dining room on 3rd floor, $159,000. inancing available. J. A. Wilson, Park pt., City Hall, landscape archt. G. L. kuil, supt. Parks.

Calif., Los Angeles—POWER IMPROVE- MENTS—City Bureau of Power & Light, 07 S. Bway., plans Power Receiving Sta- ion G, $528,000; double circuit 132,000 volt ransmission lines from Receiving Station C Receiving Station G, $583,000; construct ilver Lake Switching sys., in connection ith development of city power sys., $75,- 00; miscellaneous addns. and betterments city power transmission facilities, $296- 00; miscellaneous imprvs., betterments, 11,500, addnl. transformer bank and switch ositions $739,900, and installing synchronous ondenser, $350,000, all foregoing at Power eceiving Station A; at Receiving Station E, 9,500; installing synchronous condenser at ower Receiving Station E, $500,000; at ower Receiving Station F, $500,000; inter- onnection of power lines of Southern Cali- ornia Edison Co. with Power Receiving tation F, $250,000; plans 10% completed iscellaneous imprvs., betterments at Power eceiving Station B, $337,850; miscellaneous ddns., betterments at Power Receiving tation F, $395,360; plans 40% completed at ower Receiving Station C, $165,360; double ircuit 132,000 volt transmission line from eceiving Station B to Receiving Station D, 2,313,000; plans 35% completed addn. trans- ormer bank and switch positions at Power eceiving Station D, $627,800; miscellaneous ddns., betterments at Power Receiving Sta- ion D, $177,500; plans 5% completed new ontrol house, addnl. transformer bank and witch positions at Power Receiving Station , $1,986,300; miscellaneous addns., better- ents to production facilities, $420,000; lans 75% completed second transmission able from Harbor Steam Plant to Receiving tation C, $350,000. Financing available. S. . Morris, ch. engr., and R. R. Robinson, ch. lectrical engr., 207 S. Bway.

Calif., Modesto—AIRPORT, etc.—City, City Hall, bond election April 10, imprv. munici- al airport, $75,000; imprv. fire protection ys., $40,000. F. J. Rossi, City Hall, city ngr. CD 12/11—ENR 1/11.

Calif., Oakland—TUBE—Alameda Co., Court House, tube parallel to Posey Tube, 6,500,000. W. B. Boggs, Court House, Oak- and, co. surveyor and civil engr.

Calif., Oroville—SWIMMING POOL, etc.— City, City Hall, concrete swimming pool, 40,000; city wide park imprvs., $60,000. Financing not provided. S. J. Norris, City Hall, city engr.

Calif., Sacramento—LIGHTING SYSTEM— City, City Hall, renew lighting sys., 5 to 16 ts., $67,500; Capitol Ave. Front to 9 St., 32,500; place light cable underground, $120,- 00. F. Kalus, City Hall, city engr.

Calif., Stockton—PARKS, etc.—City, City Hall, 3 municipal park, addns., imprvs., 30,000; miscellaneous park imprvs., $70,000. . Payton, City Hall, city engr.

Conn., Greenwich—PARK—Town, W. M. Peck, selectman, Town Hall, Tod's Point ark, 148 acres, incl. community house, golf inks, club, bathing beach, picnic section, oat basin, $750,000. Financing not pro- ided. A. Blogett, Town Hall, archt.

Conn., Manchester—WAR MEMORIAL ARK—Town, S. G. Bowers, first selectman, 1 Center St., preliminary plans under way y Kane & Fairchild, 49 Pearl St., Hartford, War Memorial Park development, recrea- ional facilities incl. 1,800 capacity brick, rein.-con. auditorium, with gymnasium in emnt., East Center St. Gold Field. $200,000. Financing not provided. CD 11/16—ENR 1/30.

Conn., Stratford—PARK—Town, Wm. Shea, ngr., Town Hall, Peck's Mill park, incl. wimming facilities, recreation, etc. $25,000. Financing not provided. C. D. Lay, Putney t., consult. engr.

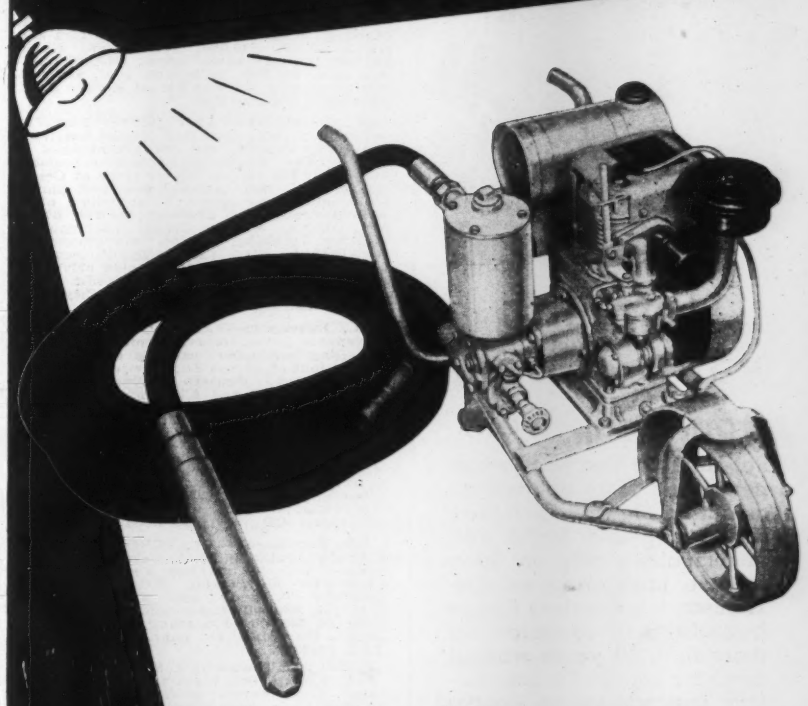
Fla., Stuart—PIER—City, City Hall, pre- liminary plans municipal pier. $35,000. ussell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., consult. engrs.

Ill., Rock Island—PARK—City, City Hall, 500 acre recreation park between 5 and 31 Aves. and between Rock Island ailroad right-of-way and Mississippi River. 4,000,000. W. J. Gallagher, City Hall, city ngr.

Ill., Rock Island—PARKING FACILITIES —City, Dpt. P. Wks., City Hall, parking acilities. $400,000. W. J. Gallagher, City all, city engr.

Ill., Rock Island—POLICE and FIRE LARM IMPROVEMENTS—Rock Island lectric Dpt., City Hall, police and fire larm imprvs. $100,000. W. J. Gallagher, ity Hall, city engr.

for GENERAL CONCRETE CONSTRUCTION



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Peerless Pumps

POSTWAR PROJECTS (Cont'd.)

★**Ind., Evansville**—AIRPORT and CIVIL CENTER— Bd. Aviation Comrs., City Hall, plans completed by Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit 2, Mich., 4-H club community hall, administration bldg., swimming pool, recreation and game courts, wading pool, concrete aprons (accommodations for 12 planes) $1,500,000. Financing not provided. CD 12/22—ENR 1/11.

Ind., Evansville—PARK IMPROVEMENTS —City Park Bd., City Hall, plans by E. H. Clark, E. Wacker Dr., Chicago, Ill., bird and reptile house, $90,000; refreshment stand, $20,000; animal house addn., $40,000; animal runs, $15,000; swimming pool, $110,000, brick, concrete, for city zoo at Mesker Park. Financing not provided.

Ia., Davenport—PARK IMPROVEMENTS —City Park Bd., City Hall, plans completed converting heating sys. for greenhouses at Vander Veer Park; plans 85% completed approx. 50,000 cu. yd. fill for levee at Credit Island Park incl. pump house and pump; plans under way imprv. Tyler School playgrounds consisting grading, shelter house, etc.; imprv. Monroe School playgrounds; clearing, grading, imprv. playground in Rockingham Blvd.; 2,200 lin. ft. concrete curb at Le Clair Park; resurfacing driveways at Le Clair, Duck Creek and Credit Island Parks, $100,000. R. C. Graham, City Hall, supt. Construction.

Ia., Davenport—PARKING AREA, etc.— Davenport Levee Imprvs. Comn., Davenport, installing permanent parking area on west side of foot of Gaines St.; service track along seawall above Western Milling Co.; completing sea wall and fill from Gaines St. to Crescent Bridge, $250,000. R. C. Graham, City Hall, supt. construction.

★**Md., Baltimore**—AIR STATION EXTENSION, etc.—City, City Hall, plans under way air station exten., B.C. 71, $400,000; completing municipal airport and imprv. other airports, B.C. 72, $3,000,000. Financing available. N. L. Smith, Municipal Bldg., ch. engr. CD 10/21/43—ENR 10/28/43.

Md., Baltimore — PLAYGROUNDS — City, City Hall, plans under way Curtis Bay playground, B.C. 133, $42,000; Druid Hill Park, Cloverdale playground, B.C. 135, $35,000; playfield Towanda and Quantico Aves., B.C. 135, $80,000; Baker and Dukeland Sts., B.C. 136, $25,000. Financing provided. N. L. Smith, City Hall, ch. engr. CD 10/21/43—ENR 10/28/43.

★**Md., Baltimore**—SWIMMING POOLS— City, City Hall, plans under way modernizing 7 swimming pools, adult pool for Carroll Park, enlarging pool Druid Park, B.C. 107. $500,000. Financing available. N. L. Smith, City Hall, ch. engr. CD 1/27/44 —ENR 2/10/44.

Md., Frederick — AIRPORT — City, City Hall, plans completed municipal airport. $250,000. Land rights not cleared. W. R. Walter, City Hall, engr. CAA made site survey and will let contract for drainage, grading, seeding. CD 1/2—ENR 1/11.

Mass., Falmouth — BATHHOUSE — Town Park Dpt., Town Hall, plans by E. Gunnar Peterson, Oyster Pond Rd., 1 story, 34x197 ft., masonry and wood frame bathhouse. $30,000. Financing not provided.

Mass., New Bedford — AIRPORT, etc. — E. Anthony & Sons, Inc., 555 Pleasant St., preliminary plans under way sea plane base and airport. To exceed $100,000. Financing not provided.

Mass., North Adams—SWIMMING POOL —City, C. E. O'Brien, mayor, City Hall, outdoor swimming pool, $50,000. Financing not provided. J. R. Hampson, 30 Backman Ave., Pittsfield, archt.

★**Mass., Salisbury** — BEACH IMPROVEMENTS—Commonwealth of Massachusetts, Conservation Dpt., State House, Boston, plans completed general imprvs., Salisbury Beach. $1,000,000. Financing not provided. Fay Spofford & Thorndike, 11 Beacon St., Boston, consult. engrs. CD 11/5/43—ENR 11/11/43.

★**Mich., Detroit** — AIRPORT — Detroit Metropolitan Aviation Auth., Detroit, making study of long term needs for airport facilities for Detroit Metropolitan area, incl. Wayne, Oakland and Macomb Counties. Approx. $5,000,000. Horner & Shifrin, Shell Bldg., St. Louis, Mo., and Smith, Hinchman & Grylls, 800 Marquette Bldg., consult. engrs. CD 7/21—ENR 8/10.

★**Mich., Detroit**—TRANSIT SYSTEM—City Transportation Bd., City Hall, plans under way transportation sys., incl. depressed highways, subways in downtown areas and street equip. for rapid transit. $100,000,000. Land rights not cleared, legal obstacles to be overcome, financing not provided. E. Andrews, 1 E. 57 St., New York, N. Y., and C. DeLeuw, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. G. R. Thompson, City Hall, engr. CD 3/30/43—ENR 4/1/13.

Mich., Detroit — PARK COMMISSARY BLDG.—Zoological Park Comn., 13 Mile Rd., Royal Oak, plans completed brick, steel, concrete commissary bldg. $150,000. Financing not provided. G. R. Thompson, City Hall, city engr. CD 3/30/43—ENR 4/1/43.

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POSTWAR PROJECTS (Cont'd.)

Mo., Joplin — AIRPORT — City, J. M. Tompkins, mayor, City Hall, plans by C. B. Manning, Spiva Bldg., airport imprvs., incl. administration bldg., hangar. **$250,000.** CD 1/1—ENR 2/8.

Mo., Kennett—AIRPORT, etc.—City, preliminary plans airport complete with runways, lighting, etc. **$414,000.** Russell & Axon, 4903 Delmar Blvd., St. Louis, Zone 8, consult. engrs.

Mont., Glasgow—STREET LIGHTING, etc.—City, City Hall, plans under way street lighting, curbs and gutters, paving and water sys. **$400,000.** Financing not provided. Corwin & Co., Medical Arts Bldg., Great Falls, consult. engrs.

Neb., Omaha—STADIUM—City, City Hall, $450,000 bond election Apr. 17, memorial stadium, L. A. Daly, Insurance Bldg., archt. CD 2/8—ENR 2/22.

★**N. J., May's Landing**—RACE TRACK, etc.—Atlantic City Racing Assoc., 770 S. Schuykill Ave., Phila., Pa., plans under way race track and airport consisting of tracks, bldgs., paving and sprinkler sys., on Black Horse Pike. **$2,400,000.**

New York—ELECTRICAL SYSTEM—Dpt. P. Wks., State Office Bldg., Albany, Zone 1, plans under way new electrical sys. at Jones Beach State Park, Nassau Co., for Conservation Dpt., Bway, Arcade Bldg., Albany, Zone 7. **$150,000.**

New York—PARK—Dpt. P. Wks., State Office Bldg., Albany, Zone 7, plans under way rehabilitation Thacher Park, Albany Co., for Dpt. Conservation, Broadway Arcade Bldg., Albany, Zone 7. **$335,500.**

N. Y., Great Kills (Sta. Staten Island)—ELECTRICAL WORK, etc.—Parks Dpt., plans completed electrical work in hydraulic fill areas, Contr. R-16-343 and sewage disposal sys., Contr. R-16-443, both Great Kills Park. **$300,000.** Financing not provided. E. A. Sears, 3 E. 37 St., New York 16, engr.

N. Y., Middletown—ATHLETIC FIELD—City, City Hall, plans under way high school athletic field. **$40,000.** State Aid Planning Funds allotted.

N. Y., New York—PARK—Dpt. Parks, Arsenal Bldg., plans under way constructing Crotona Park, Old Boro Hall Sect., Proj. P-121. **$275,000.** W. E. Andrews, 1 E. 57 St., New York 22, engr.

N. Y., Watervliet—BATHING POOL—City, City Hall, plans under way bathing pool. $65,000. State Aid Planning Funds allotted.

N. C., West Jefferson—AIRPORT Scenic Airways Corp., West Jefferson, plans under way airport, incl. hangar, on 30 acre tract in Beaver Creek Section. Site purchased.

O., Cambridge — PARK AUDITORIUM — City, Municipal Bldg., preliminary plans park auditorium. **$65,000.** Legal obstacles to be overcome, financing not provided.

O., Portsmouth — AIRPORT, etc. — City, City Hall, airport development, **$100,000**; cemetery development, **$50,000.** Land rights not cleared, financing not provided. J. F. Parkinson, Portsmouth, engr.

Ore., Corvallis—SWIMMING POOL—City, City Hall, outdoor swimming pool. **$30,000.** V. L. Goodnight, City Hall, engr.

★**Pa., Hazelton** — AIRPORT — City, City Hall, plans 50% completed clearing, grubbing, grading, drainage, paving 3 runways, 4,000 ft. long, **$900,000.** CAA will help finance. P. Lamont, City Hall, city engr. CD 1/12—ENR 1/25.

★**Pa., Phila.** — ATHLETIC FIELDS and PLAYGROUND EXPANSIONS — Bd. Educ., A. B. Anderson, secy., 21 and Parkway, plans completed West Philadelphia Athletic Field Project 1, **$100,000**; Project 2, $100,000; Project 3, **$100,000**; Project 4, $100,000; North Philadelphia Athletic Field Project 1, **$100,000**; Project 2, **$100,000**; plans 50% completed school playground expan. program Project 16, **$65,000**; Project 17, $65,000; Project 18, **$65,000**; Project 19, $65,000; Project 20, **$62,500**; Project 21, $62,500; Project 22, **$62,500**; Project 23, $62,500; Project 24, **$62,500**; Project 25, $62,500; Project 26, **$62,500**; Project 27, $62,500; Project 28, **$62,500**; Project 29, $62,500; Project 30, **$62,500**; Project 31, $62,500; Project 32, **$62,500**; Project 33, $62,500; Project 34, **$62,500**; Project 35, $62,500; Project 36, **$62,500**; Project 37, $62,500; Project 38, **$62,500.** Financing not provided.

★**Pa., Phila.** — PLAYGROUND EXPANSIONS, etc. — Bd. Educ., A. B. Anderson, secy., 21 and Parkway, plans 50% completed school playground expan., Proj. 1 $65,000, Proj. 2 **$65,000**, Proj. 3 **$65,000**, Proj. 4 **$65,000**, Proj. 5 **$65,000**, Proj. 6 **$65,000**, Proj. 7 **$65,000**, Proj. 8 **$65,000**, Proj. 9 **$65,000**, Proj. 10 **$65,000**, Proj. 11 **$65,000**, Proj. 12 **$65,000**, Proj. 13 **$65,000**, Proj. 14 **$65,000**, Proj. 15 **$65,000**, Proj. 39 **$57,500**; Central City Athletic Field, **$150,000.** Financing not provided.

Pa., Phila.—SCHOOL PLAYGROUND EXPANSION PROGRAM—Bd. Educ., A. B. Anderson, secy., plans 50% completed school playground expan. program, Proj. 39, $57,500. Financing not provided.

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POSTWAR PROJECTS (Cont'd.)

★**Pa., Phila.**—SHOWERS and LOCKERS, etc.—City Bd. Educ., A. B. Anderson, secy., plans 50% completed showers, lockers, plumbing and heating Proj. 1, $30,000; Proj. 2 $30,000; Proj. 3 $30,000; Proj. 4 $30,000; Proj. 5 $30,000; Proj. 6 $30,000; Proj. 7 $30,000; Proj. 8 $30,000; Proj. 9 $30,000; Proj. 10 $30,000; Proj. 11 $30,000; Proj. 12 $30,000; Proj. 13 $30,000; Proj. 14 $30,000; Proj. 15 $30,000; Proj. 16 $30,000; Proj. 17 $30,000; Proj. 18 $30,000 Proj. 19, $30,000; Proj. 20 $30,000; Proj. 21 $30,000; Proj. 22 $30,000; Proj. 23, $30,000. Financing not provided.

Tex., Brownwood—PARK—City, City Hall, recreation park and rodeo show grounds, $250,000. Financing not provided. C. W. McClelland, 1209 Durham St., city engr. CD 4/21—ENR 5/4.

Tex., Dallas—PARK IMPROVEMENTS—City, City Hall, plans 25% completed park imprvs., in Northeast Dallas-White Rock Lake section. $88,000. Financing available. Hare & Hare, 114 W. 10 St., Kansas City, Mo., and c/o City Hall, Dallas, consult. engrs.

Tex., Dallas—PARK—City, City Hall, plans 40% completed Hall St. municipal park, incl. concrete swimming pool, athletic courts, concrete bleachers, grading, landscaping, etc. $100,000. Financing available. Hare & Hare, 114 W. 10 St., Kansas City, Mo., consult. engrs.

Tex., Dallas (Oak Cliff)—PARK—City, City Hall, plans under way, Kidd Spring Park, incl. swimming pool, athletic courts, playgrounds, roads, grading, etc. $325,000. Financing available. Hare & Hare, 114 W. 10 St., Kansas City, Mo., and c/o City Hall, Dallas, consult. engrs.

Tex., Galveston—LIVESTOCK AND SHOW RING—Galveston Co., plans 25% completed by F. Stafford, Guaranty Bldg., live stock and show ring, $50,000. Financing not provided.

★**Tex., Houston**—Harris Co., H. L. Washburn, aud., engineering services by Palmer & Baker, Inc., consult. engrs., Staples Poke Bldg., Mobile, Ala., 2 ship channel highway tunnels. $10,000,000. Harris Co. voted $3,750,000 and Navigation District voted $1,250,000. Harris Co. to file application for $5,000,000 federal aid. CD 12/28—ENR 1/11.

Tex., Longview—AIRPORT BLDG., etc.—Gregg Co., M. H. Gibson, judge, Longview, plans 50% completed by Flint & Broad, Burt Bldg., Dallas, airport administration bldg. and control tower. $100,000–$125,000. Financing available. CD 1/23—ENR 2/8.

Tex., Plainview—AIRPORT—Hale Co., Plainview, plans 50% completed airport, incl. 2 runways, taxiway, concrete apron, caliche base, prime coat, seal coat multiple T hangars, administration bldg. $150,000. Financing available. W. J. Williams, P. O. Box 1272, consult engr. CD 12/15—ENR 12/21.

Tex., San Antonio—AIRPORT IMPROVEMENTS—City, City Hall, plans 10% completed administration bldg., $200,000; plans 25% completed outside area, taxiway lighting, etc., $40,000. To vote bond issue in Spring. A. B. & R. M. Ayres, Transit Tower Bldg., archts. M. L. Diver, 1504 Main St., consult. engr. CD 1/10. 1/18—ENR 1/25, 2/8.

Vt., Burlington—LIGHTING SYSTEM IMPROVEMENTS—City, City Hall, plans under way 5 year program imprv., exten. lighting sys. $250,000. Financing not provided. H. I. Williams, City Light Dpt., City Hall, supt. and engr.

Vt., Burlington—PARKS, etc.—City, City Hall, plans underway imprv. of parks, playgrounds, bathing beach, winter sports, etc. $190,000. Wm. L. Hammond, supt.; hangar administration bldg., runway, clearing, grading, etc., $375,000, G. C. Stanley, City Hall, city engr. Financing not provided. CD 8/24—ENR 9/7.

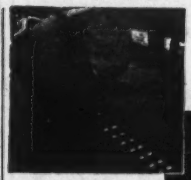
Va., Lynchburg—AIRPORT—City, Box 60, City Hall, plans under way Preston Glenn Airport exten. runways, paving, and other incidental work planned in connection with CAA proposed imprvs. $100,000. Financing not provided. Dpt. P. Wks., Box 60, City Hall, engrs.

★**W. Va., Fairmont**—AIRPORT, etc.—City, City Hall, airport, terminal and landing strips. $500,000. S. A. Shuttleworth, City Hall, city engr. CD 1/24—ENR 2/8.

W. Va., Fairmont—PARKS—City, City Hall, parks. $200,000. S. A. Shuttleworth, City Hall, city engr.

★**W. Va., Huntington**—AIRPORT—City, City Hall, tri-state airport. $3,000,000–$7,000,000. Land rights not cleared, legal obstacles to be overcome and financing not provided. F. W. Whitney, City Hall, Zone 1, city engr. CD 11/21—ENR 12/14.

★**W. Va., Morgantown**—AIRPORT RUNWAYS, etc.—City, 389 Spruce St., plans 75% completed exten. airport runways, $2,500,000; development park at Morgantown Recreation Park, $343,500; off street parking facility, Walnut and Elk Sts., $104,000. Land rights not cleared, legal obstacles to be overcome and financing not provided. H. Boyles, 389 Spruce St., Planning Bd. engr.



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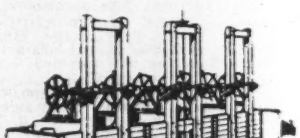

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POSTWAR PROJECTS (Cont'd.)

W. Va., South Charleston—PARKS, etc.—Town, 3 parks, total acreage of 112; 1 swimming pool with land requiring 5 acres; 3 neighborhood play areas, 17 acres, totaling $300,000. Land rights not cleared, legal obstacles to be overcome, financing not provided. K. C. Catlette, City Hall, engr.

★**Wis., Eau Claire**—AIRPORT—City, City Hall, plans 90% completed Class 3 airport, 3 surface runways approx. 12,000 long. $600,000. Legal obstacles to be overcome. CAA preparing final plans. A. R. Garnock, City Hall, city engr. CD 1/26—ENR 2/8.

Wis., Madison—PARKS, etc.—City, J. R. Law, mayor, City Hall, plans under way Franklin Field storage bldg., $30,000; bridges, Vilas and Tenney Parks, $4,400; storage bldgs. various parks, $12,000; Vilas Park Zoo addn. $10,000; grading Frank Hoyt Park, $6,000; outdoor theatre Vilas Park, $42,000. Financing not provided. T. H. Harrington, City Hall, city engr.

Wis., Waukesha—BATHHOUSE AND POOL—City, City Hall, bathhouse and pool, $40,000. Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waukesha—PARK IMPROVEMENTS—City, City Hall, plans under way imprv. parks, park bldgs., roads, $90,000. Financing not provided. W. E. Dick, City Hall, city engr.

Wis., Waunatosa—STREET LIGHTING—City, 7616 Harwood Ave., plans 30% completed street lighting, concrete poles, underground cable. $300,000. Financing not provided. M. F. Linnan, 7616 Harwood Ave., engr.

★**Que., Quebec City**—TUNNEL WIDENING—Canadian Pacific Ry. Co., J. E. Armstrong, ch. engr., Windsor Station, Montreal, widening mile long tunnel under Cape Diamond which links Wolf's Cove and St. Malo. $2,000,000.

READY FOR BIDS

Md., Baltimore—HANGAR, etc.—City, City Hall, plans completed land plane hangar and exten., B.C. 69. $350,500. Financing available. N. L. Smith, Municipal Bldg., ch. engr. CD 10/21/43—ENR 10/28/43.

Mont., Great Falls — GRANDSTAND — Northern Montana State Fair Assn., Montana Bank Bldg., plans completed concrete grandstand. $250,000. Financing provided. Corwin & Co., Medical Arts Bldg., consult engrs. CD 6/1—ENR 6/15.

N. M., Roswell—AIRPORT—City, Thos. J. Hall, mayor, City Hall, plans completed airport imprvs. $75,000. Financing provided. Headman, Ferguson, Carollo & Classen, 413 Martin Bldg., El Paso, Tex., consult. engrs. L. L. Fowland, City Hall, city engr. CD 1/8—ENR 2/8.

N. Y., Flushing—COMFORT STATIONS, etc.—Dpt. Parks, Arsenal Bldg., 64 St. and Central Park, New York, plans completed comfort station and concession bldg., near 69 Ave. and 210 St., Contr. No. Q-21-143, $53,600; comfort station between Francis Lewis and Hollis Court Blvds., Contr. No. Q-21-443, $47,600, both in Cunningham Park. Skidmore, Owings & Merrill, 5 E. 57 St., New York, Zone 22, archts. CF 3/26/43—ENR 4/1/43. under New York

Tex., San Antonio—SWIMMING POOLS—City, City Hall, plans completed rein.-con. outdoor Olympic type swimming pool, Brackenridge Park area, $125,000; rein.-con., outdoor standard type swimming pool, Eagle Field area, $100,000. Financing available. M. L. Diver, City Hall, city engr. CD 3/9/44—ENR 3/23/44.

Tex., Taylor—AIRPORT—City, City Hall, plans completed airport. $60,000. Financing available. H. G. Richards, City Hall, engr.

Vt., Rutland—HANGAR—City, City Hall, plans completed hangar. $60,000. P. Webber, Rutland, archt. CD 1/22—ENR 2/8.

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Of $17,000,000,000 of proposed postwar construction at beginning of 1915 only $550,000,000 was reported "ready for bids", plans complete and financing available.

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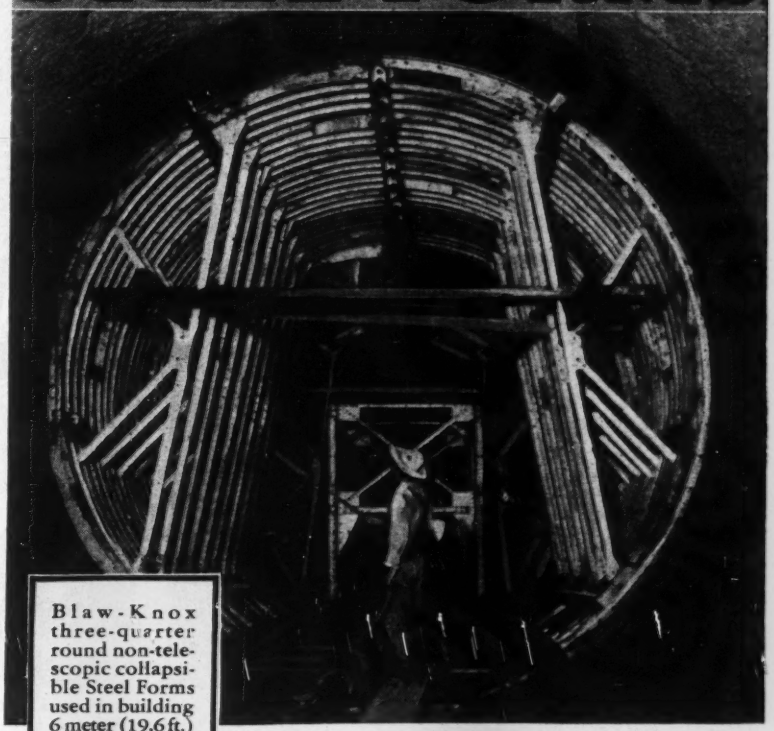
Send ready-for-bids projects news to Elsie Eaves, Manager, Business News Department, Engineering News-Record, 330 W. 42 St., New York 18, N. Y.

ADVANCED TO ACTIVE STATUS

Mo., St. Louis—COURT OF HONOR—City, c/o M. M. Kinsey, pres., Bd. Pub. Serv., 304 City Hall, and St. Louis World War II Memorial Com., P. S. Miravalle, genl. chn., City Hall, 13 and Market Sts., Zone 1, project cancelled, Court of Honor, incl. shaft 87 ft. high grouped in composition with walled in sunken garden, excav., grading, concrete piling, concrete work, granite work, etc. Memorial Plaza in blocks bounded by 13, 14, Market and Chestnut Sts. Work now going ahead. CD 1/13—ENR 12/28.

Tex., San Antonio—RADIO STATION—K.A.B.C., Milam Bldg., project cancelled 2 story, brick, concrete 50,000 watt radio station, 9 mi. northwest of here. Over $80,000. Work now going ahead. Bartlett Cocke, 1504 Milam Bldg., archt. CD 11/1—ENR 11/16.

BLAW-KNOX STEEL FORMS



Blaw-Knox three-quarter round non-telescopic collapsible Steel Forms used in building 6 meter (19.6 ft.) tunnels for El Palmito Dam project, State of Durango, Mexico.

MAKE THE MOST OF YOUR ESTIMATES!

Before your plans are drawn on a concrete job, consult Blaw-Knox Form Engineers. Their specialized experience will help to promote economy in construction and to secure quality in the finished job.

Even after preliminary plans and estimate are submitted, these engineering specialists may discover potential economies that will account for overall savings in final detail planning.

Remember that Blaw-Knox specialized engineering consultation is available to help you make the most of your estimates.

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BLAW-KNOX STEEL FORMS are used for construction of

TUNNELS WALLS SEWERS DAMS BRIDGES PIERS
CONDUITS ROADS SEWAGE DISPOSAL PLANTS

and other varieties of concrete construction

BLAW-KNOX DIVISION of Blaw-Knox Co.
2001 FARMERS BANK BUILDING · PITTSBURGH, PA.
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On the Quai de L'Arsenal in France, this 15-B excavates for a track spur to speed supply lines.
To open the way for military traffic, a 15-B clears away the debris from the streets of Domfront, France
FOLLOWING-UP THE ATTACK
At Le Haye du Puits, in France, this 15-B tears down the condemned walls of a shattered building.
A ½-yard 15-B, in wartime wooden dress, clears a Beach in New Guinea to facilitate unloading cargo from landing craft.

Signal Corps Photos

WHILE battle-front excavators help to put extra sting into the Allied attack, their counterparts behind the lines — in the wake of advancing arms — keep open the routes of supply. To them falls the job of repairing bomb-gouged roads, removing the rubble of blasted ruins, clearing the debris of battle.

By reason of their outstanding performance as well as their number, the Bucyrus-Eries in this work are, as always, conspicuous. Their easy handling, fast action, smooth application of power, and all-around strength again make them output leaders, just as they have been for years — and will be in the reconstruction to come.

BUCYRUS ERIE
SOUTH MILWAUKEE WISCONSIN

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *SCOTT McLEOD, Statistics* *J. A. MAHONEY, Reports*

(Daily service also available—Write for details)

WATER SUPPLY

PROPOSED WORK

Neb., Omaha — Metropolitan Utilities ★Dist., 18 and Harney Sts., 5 water lines to stock yards and packing house district. $1,000,000. CD 1/2—ENR 1/4.

Tex., Mission — City, L. Duncan, mayor, City Hall, $170,000 bond election March 17, 100,000 gal. elevated water tank, enlarging storage reservoir, increasing pump. capacity, filtration plant enlargement and exten. distr. sys. H. H. Ewing, Mission, eng. CD 9/20—ENR 9/28.

BIDS ASKED

Bids Asked March 12

†Tex., Fort Worth—S. H. Bothwell, city mgr., City Hall, Contr. 5, Holly pump. plant imprvs., Tex. 41-641. **FWA.** Bids 1/13 rejected. Plans deposit $25. Freese & Nichols, Capps Bldg., engrs. CD 2/19—ENR 2/22, under LB.

Bids Asked March 13

N. C., Tryon—Town, water distr. exten., 4,000 ft. 6 in. c.i. main, valves, hydrants, etc. The Harwood Beebe Co., Spartanburg, S. C., engrs.

LOW BIDDERS

O., Toledo—City, Water Div., City Hall. Feb. 27, 6,100 ft. 24 in. c.i. water feeder line, incl. 290 ft. tunnel extending from Collingwood Blvd. and West Central Ave., north on Collingwood to Wolcott Blvd. to Eggman Ave. Extended, crossing Ten-Mile Creek to Sylvania Ave., from Kalill Co., 4161 W. 150 St., Cleveland, **$108,182.** Est. $100,000. O. Clark, div. engr., Water Dpt.

†Tex., Austin — U. S. Engr., Fort Sam Houston, Feb. 27, water sys. addn. for ordnance shop, Camp Mabry, from R. Smith, Box 6, San Antonio. **$24,681.**

Tex., Houston—City, 163,000 lin. ft. 1 and 2 in. c.i. pipe, black coated and wrapped, from Republic Supply Corp., Petroleum Bldg., **$82,290.**

Wash., Vancouver—City, City Hall, Feb. 21, 250,000 gal. steel water tank and tower, from Chicago Bridge & Iron Co., Rialto Bldg., Chicago, Ill. **$28,536.** M. Ray, City Hall, city engr. CD 2/2—ENR 2/8.

CONTRACTS AWARDED

†Fla., Key West — Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., pump station, NOY 11096, to Charley Toppino & Sons, 7255 Caroline St. **$112,135.**

Mont., Fairfield—City, City Hall, water supply sys., with well, pumphouse, 60,000 gal. elevated steel tank, 20,700 ft. 4- to 8-in. watermains, to E. Johnson, Glasgow, **$75,121.** Corwin & Co., Medical Arts Bldg., Great Falls, archts. Bids 2/23. CD 2/9—ENR 2/15.

N. D., Grand Forks—City, C. J. Evanson, and., watermains, to Northern Constr. Co., 509 S. 3 St., **$34,246.** Bids 2/17.

Que., St. Fabien de Panet—Municipality, watermains, to Philippe Tardif, 7 Notre Dame St., Panet, **$15,000.**

SEWERS, WASTE DISPOSAL

PROPOSED WORK

†Pa., Aspinwall—Veteran's Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., sewage disposal plant replacement, $40,000.

Tex., Mission — City, L. Duncan, mayor, City Hall, $80,000 bond election March 17, enlarging sewage disposal plant, increasing sludge digesting capacity and larger sprinkler filter area, sewage collecting lines. H. H. Ewing, Mission, engr. CD 9/20—ENR 9/28.

Man., Winnipeg—Greater Winnipeg Sanitary Dist. Bd., Winnipeg, removing weirs, replacing by sumps, reconstructing flap gates where necessary. $350,000. W. D. Hurst, City Hall, engr.

N. B., Dalhousie—Municipality, sewers. $35,000.

Ont., Oakville—Town, J. M. Campbell, mayor, C. H. Byers, clk., City Hall, installing sewage disposal plant, 750,000 gal. per day capacity with 30,000 gal. overflow. $85,000. R. H. Darling, 36 James St. S., Hamilton, engr. CD 12/11—ENR 12/21.

Ont., Point Edward—Municipality, drainage program, $50,000. J. C. Monteith, County Bldg., Sarnia, engr.

Ont., Sudbury—City, H. P. McKeown, clk., preparing plans drainage sys. $100,000.

Ont., Wallaceburg—Council, sewer extens., incl. new pump. plant. $25,000-$30,000. W. Colby, Town Hall, engr.

Location of ENR Correspondents

Symbols and Abbreviations Include:

†	Federal Government
★	Project of $500,000 or over
ENR	Engineering News-Record
CD	Engineering New-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

BIDS ASKED

Bids Asked March 13

Ont., New Toronto—F. R. Longstaff, town clk., 4,100 ft. 42- to 54-in. trunk sewer in Birmingham St. $45,000. James, Proctor & Redfern, Ltd., Excelsior Life Bldg., Toronto, engrs. CD 3/1—ENR 1/18.

Bids Asked March 15

La., New Orleans—City Purchasing Div., City Hall Bldg., exten. incinerater C. incl. piling, excav., grading, backfilling, paving, etc. Proposal 5018.

Bids Asked March 16

Wis., Appleton—City, E. E. Sager, clk., City Hall, 15,999 ft., 10- to 27-in. double and triple strength vitr. clay or concrete storm sewers in area north of Wisconsin Ave. Plans deposit $5. L. M. Schindler, City Hall, city engr. McMahon Engr. Co., Manasha, consult. engr. CD 2/27—ENR 3/1.

Bids Asked March 20

Tex., Weslaco—City, V. C. Thompson, secy. and mgr., City Hall, sanitary sewerage sys., addns., imprvs., incl. 6 and 8 in. vitr. tile collection lines, manholes, and 2 sewage lift pump. plants, sludge collection equip., etc. Plans deposit $10. Valco, Inc., M & M Bldg., Houston, engrs.

Bids Asked in Early Spring

Okla., Guymon—City, City Hall, sewage plant, $50,000. F. E. Devlin, 260N E. Kellog St., Wichita, Kan., engr. CD 11/22—ENR 11/30.

LOW BIDDERS

N. Y., Idlewild—Comr. Marine & Aviation, Pier A, foot of Battery Pl., North River, New York, Zone 4, Feb. 27, Contr. 2428, sewerage sys. at Municipal Airport, Contr. 12, from Rusciano & Son Corp., 728 E. 213 St., New York, Zone 67, **$133,463.** CD 2/20.

†Va., Portsmouth—City, City Hall, installing approx. 6,160 ft. 10 to 24-in. c.i. suction mains to collect sewage from northeast section of city, Va. 44-141, to Jarcho Brothers, Inc., 426 W. 23 St., Norfolk, **$133,599.** **FWA.** Bids 2/7. CD 1/9—ENR 1/11.

BRIDGES

PROPOSED WORK

Ont., Wallaceburg—Kent Co., W. M. Abraham, clk., Harrison Hall, Chatham, bridge at Junction of Dufferin Ave. No. 40 Hy. and James St. $200,000. W. D. Colby, Harrison Hall, Chatham, engr.

★**Quebec**—Dpt. Roads, Quebec City, abolish level crossings throughout Province. About $5,000,000.

LOW BIDDERS

Louisiana—State Hy. Dpt., Baton Rouge, Feb. 28, 0.301 mi. Tangipahoa River Bridge, Tangipahoa Parish, from Barber Bros. Co., Reymond Bldg., Baton Rouge. **$32,504.**

Virginia—Dpt. Hys., Richmond, Feb. 27, 298 ft., steel beam bridge, Fluvanna Co., from Bowers Constr. Co., Box 1706, Raleigh, N. C., **$25,437.** CD 2/15—ENR 2/22.

Washington—State Hy. Dpt., Olympia, Feb. 27, steel, concrete girder bridges, Klickitat Co., and overcrossing on Elm St., Cowlitz Co., from M. P. Munter, Vance Bldg., Seattle, Zone 1, **$34,498** and **$45,228** respectively; 0.326 mi. Whatcom Co., from C. V. Wilder, Bellingham, **$46,357.** CD 2/13—ENR 2/15.

BIDS ASKED

Bids Asked March 15

Nebraska—State Dpt. Rd. & Irrigation, W. G. Scott, engr., Lincoln, furnishing treated bridge lumber, structural steel for superstructure hand rail, 124,320 lb. steel piling, Ashland-Gretna, FA WER 1-A, Sarpy Co.; 243,600 lb. steel piling, 134,640 lb. steel piling, etc., Fontanella-Nickerson, FA FAS 442-B (2), Dodge Co.

Bids Asked March 23

Tennessee—State Hy. Dept., Nashville, reconstructing bridge over French Broad River 0.083 mi. on State Hy. 107, near Del Rio, S.A.P. 581-A, Cooke Co.; 0.028 mi. bridge over West Fork of Little Pigeon River, on State Hy. 71, S.A.P. 584-A, approx. 1 mi. south of Sevierville, Sevier Co.

CONTRACTS AWARDED

Alabama—State Hy. Dpt., Montgomery, 0.104 mi. bridge, Montgomery and Lowndes Counties, and 0.254 mi. bridges, Lowndes Co., to Goodwyn & Murphree Co., Troy, **$68,416** and **$165,428** respectively. Bids 2/23.

†Va., Fort Myer (sta. Arlington)—U. S. Engr., 21 St. and Constitution Ave. N.W., Wash. 25, D. C., pedestrian underpass at South Post. Contr. W-49-080-Eng-200, to Cayuga Constr. Corp., 30 Vesey St., New York, Zone 7, **$31,187.**

STREETS AND ROADS

BIDS ASKED

Bids Asked March 13

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, asphalt resurfacing Classon, 8, 10, St. Marks, Schenck and Greene Aves., Humboldt, Dean, Strauss, Weirfield, 5 and 53 Sts.; grading, curbing, flagging and permanent asphalt on 6 in. concrete paving Ryder Ave., W. 1 St.

Bids Asked March 14

Ia., Ida Grove—Bd. Supervs. Ida Co., maintenance graveling various secondary roads, incl. 32,000 cu.yd. gravel, 325,000 units addnl. half mile haul, 22,000 cu.yd. stripping. J. W. Fair, Ida Grove, acting co. engr.

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STREET AND ROADS (Bids Asked, Cont'd.)

Bids Asked March 20

Pennsylvania—J. U. Shroyer, secy. State Dpt. Hys., Harrisburg, widening pavement with plain concrete base course 0.56 mi. U.S. Route 15, Lawrence Twp., Tioga Co.; bituminous surfacing 2.76 mi. Traffic Routes 253, 291, U.S. Route 13 and on U.S. Route 322, in Chester, Trainer Boro and Chester Twp., Delaware Co.; 3.4 mi. Traffic Route 78, incl. exten. rein.-con. structure, Ararat Twp., Susquehanna Co.; widening pavement with plain concrete and crushed aggregate base 2 ft. wide and surfacing new base and existing pavement with bituminous surfacing 18 ft. and variable in width, etc., U.S. Route 322, U.S. 119, T.R. 36 and T.R. 336, Brookville Boro, Young Twp., Punxsutawney Boro and Conoe Twp., Jefferson and Indiana Counties; rein.-con. paving 1.34 mi. T.R. 403, in Johnstown, West Taylor Twp., Cambria Co.; bituminous paving 0.58 mi. Rural Route 67029, in Philadelphia, Philadelphia Co.; repairing steel, concrete bridge over Sand Run, Rural Route 461-2, Whitemarsh and Springfield Twp., Montgomery Co. Plans deposit $2.50 each.

Bids Asked March 30

Washington—C. E. Hickey, dir. State Hy. Dpt., Olympia, grading, draining, constructing hydraulic embankment on 1.59 mi. Primary State Hy. 1, Kalama to Kalama River, F.A.P. SN-U-FAP 147-H 1, Unit 1, Cowlitz Co. Plans deposit $2.

Bids Asked March 23

Kentucky—Dpt. Hys., Frankfort, grading, draining, low type surfacing 8.388 mi. Correttsville-Clover Fork Rd. beginning at end of improved section near Slemp, and extend. into mine area at head of Clover Fork at Leslie Co. line, FAS 64 A(1), SP 97-262, Perry Co.

Tennessee—State Hy. Dpt., Nashville, grading, drainage, surfacing 5.493 mi. sect. State Hy. 61, beginning at Clinton Engineer Works at Oakridge exten. to State Hy. 9, in Clinton. DA-WI 31-A (1); 6.772 mi. 2 addnl. traffic lanes on State Hy. 9, beginning at Knox Co. line, exten. to point approx. 0.3 mi. south of Clinch River Bridge at Clinton, SN-F.A.P. 82-A (3), both Anderson Co.

Bids Asked April 6

Kentucky—Dpt. Hys., Frankfort, bituminous resurfacing 11.38 mi., Group 9 (1945) incl. 9.185 mi. Tracey-Princeton Rd. (Ky. 128), from U.S. 68 to Caldwell Co. line, excluding approx. 2 mi. improved section, S.P. 111-94; 1.097 mi. Cadiz-Cerulean Rd. (Ky. 124), in and near Cerulean, S.P. 111-54, 1.118 mi. Gracey-Cerulean Rd. (Ky. 126), S.P. 111-114, all foregoing Trigg Co.; 43.294 mi. Group 10 (1945), incl. 11.06 mi. Liberty-Jamestown Rd. (Ky. 35) from Courthouse Square in Liberty to Bridge near Dunnville, S.P. 22-31, Liberty-Lebanon Rd. (Ky. 49), from Ky. 35 in Liberty to Marion Co. line, S.P. 23-141; 17.019 mi. Lebanon-Liberty Rd. (Ky. 49), from 0.3 mi. in Lebanon to Casey Co. line, S.P. 78-42, all foregoing Casey and Marion Counties; 21,319 mi. Group 11 (1945) incl. 10.874 mi. Bloomfield-High Grove Rd. (Ky. 48), from in Bloomfield to U.S. 31 E. at High Grove, S.P. 90-25, 90-45, 108-87; 10.445 mi. Springfield-Taylorsville Rd. (Ky. 55) from ¾ mi. west of Springfield to Spencer Co. line, S.P. 90-85, 115-149, both Nelson, Spencer and Washington Counties; 31.011 mi. Group 12 (1945), incl. 21.159 mi. Carrollton-Gratz Rd. (Ky. 389), S.P. 21-112; 52-27, 2.552 mi. road through Butler Park, S.P. 21-192; 7.3 mi. Owenton-Jonesville-Williamstown Rd. (Ky. 36), from Ky. 35 to Jonesville and incl. approaches to Eagle Creek Bridge, S.P. 94-33, 41-94, all foregoing Carroll, Grant, Henry and Owen Counties; 19.235 mi. Group 14 (1945), incl. 5.599 mi. Grants Lick-Peach Grove Rd. (Ky. 154), from Grants Lick to Peach Grove, S.P. 19-91, 96-37; 3.065 mi. Falmouth-Alexandria Rd. (U.S. 27), from Ky. 17 to Butler, S.P. 96-17, 10.271 mi. Falmouth-Covington Rd. (Ky. 17), from new U.S. 27 to Kenton Co. line, S.P. 96-217, 96-17, all foregoing Campbell and Pendleton Counties; 44.734 mi. Group 16 (1945), incl. 17.936 mi. Harlem-Closplint Rd. (Ky. 38), from east corporate limit of Harlan to Closplint, S.P. 48-48, 5.083 mi. Evarts-Dizney Rd. (Ky. 215), from Ky. 38 to Dizney, S.P. 48-68, 16.399 mi. Harlan-Virginia Line Rd. (Ky. 66), from south corporate limit of Harlan to Virginia line, S.P. 48-88, 1.134 mi. Caywood-Smith Rd. (Ky. 217) from Ky. 66 and exten. toward Smith, S.P. 48-108, 4.322 mi. Harlan-Liggett-Blackmont Rd. (Ky. 72), from opposite Black Star School to Bell Co. line, S.P. 48-128, approx. 10 mi. Cumberland-Lynch-Virginia Line Rd. from Cumberland to Virginia line, excluding improved sections, S.P. 48-38, all foregoing Harlan Co.; bituminous and rock asphalt resurfacing 35.874 mi. Group 13 (1945), incl. 8.884 mi. U.S. 150 in Stanford on Danville Rd. and the Mt. Vernon Rd. S.P. 69-10; 69-70, 5.12 mi. Stanford-Lancaster Rd. (U.S. 27), from in Stanford to Garrard Co. line, S.P. 69-30, 14.244 mi. Stanford-Liberty Rd. (Ky. 78 and 35), from in Stanford to Casey Co. line, S.P. 69-150; 69-170, 5.589 mi. Crab Orchard-Lancaster Rd. (Ky. 39), from in Crab Orchard to Garrard Co. line, S.P. 69-50, 3.119 mi. Lancaster-Stanford Rd. (U.S. 27), from the Courthouse Square in Lancaster to Lincoln Co. line, S.P. 40-66, 6.818 mi. Lancaster-Crab Orchard Rd. (Ky. 39), from U.S. 27 in Lancaster to Lincoln Co. line, S.P. 40-46, all foregoing Garrard and Lincoln Counties; bituminous resurfacing and rock asphalt paving 30.594 mi. Group 15 (1945), incl. 15.677 mi. Maysville-Parish Rd. (U.S. 68), from top of hill, near Maysville to Fleming Co. line, S.P. 81-175, 12.8 mi. Maysville-Mt. Olivet Rd. (U.S. 62), from U.S. 68, south of Maysville to Robertson Co. line, S.P. 81-195, 1.011 mi. Forest Ave. in Maysville from Lexington St. to Junction with Ky. 10, S.P. 81-35, 0.506 mi. Fourth St., in Maysville from Plum St. to Lexington St., S.P. 81-95, 0.6 mi. Maysville-Paris Rd. (U.S. 68), from corporate limit of Maysville and exten. south, S.P. 81-175, all foregoing Mason Co.

Bids Asked

N. J., Pittsgrove (mail Elmer)—Town, Olivet School, rejected bids Feb. 12, imprv. 18,921 sq. yd. Sheep Pen Rd. Skinner & Compton, 63 Market St., Salem, engrs. CD 2/8.

LOW BIDDERS

†D. C., Wash.—District Comrs., District Bldg., Feb. 28, imprv. sidewalks, curbs and gutters, DC 49-177-N, from Highway Engr. & Constr. Co., 7 and T Sts. N.E., **$25,587**; imprv. alleys, sidewalks, curbs and gutters, D. C. 49-185-N, from Wilmoth Paving Co., Washington National Airport, Arlington, Va., **$43,447. FWA.**

Massachusetts—Commonwealth of Massachusetts, Dpt. P. Wks., Boston, Feb. 27, resurfacing streets, and reconstructing seawall, in Oak Bluffs, from Berke Moore Co., Inc., 11 Boylston St., Brookline, **$94,401.**

N. Y., New Gardens—President Queens Boro, Boro Hall, 120-55 Queens Blvd., Zone 15, Feb. 19, from John Meehan & Son, 90 West St., New York, Zone 6, repaving Fairview Ave. from Gates Ave. to Palmetto St., etc., **$33,198**; 71 St. from Central to Cooper Aves., etc., **$56,345**; 49 St. from 48 Ave. to Queens Blvd., etc., **$25,427.** CD 2/8—ENR 2/15.

★**Texas**—State Hy. Comn., Austin, Feb. 28, imprv. 9.203 mi. Hunt Co., from Texas Bitulithic Co., 111 Commerce St., Dallas, **$138,292***9.877** mi. Coleman Co., from H. L. Campbell, 2435 Winton Terrace, Fort Worth, **$288,664***21.246** mi. Navarro and Freestone Counties, from Gaylord Constr. Co., 803 Blodgett Ave., Houston, **$214,288***38.29** mi. Brewster Co., from H. Page, Georgetown Rd., Austin, **$216,764** est. **$300,000***33.148** mi. Runnels and Tom Green Counties, from Thomas & Ratliff, Rogers, **$207,503***7.352** mi. Potter Co., from Bell & Braden, Amarillo, **$248,000.** CD 2/19.

†Va., Fort Meyer (sta. Arlington)—U. S. Eng., 120 Wall St., New York 5, N. Y., Feb. 27, roads, walls and drainage at South Post, from Wilmoth Paving Co., Washington National Airport, Arlington, **$64,525.**

Washington—State Hy Dpt., Olympia, Feb. 27, imprv. 4.124 mi. Kittitas Co., from J. M. Harrison, 225 Wakefield Dr., Tacoma, **$78,132**; 16.6 mi. Pacific and Wahkiakum Counties, from D. F. Whittaker, Smith Tower. 2 and Yesler Sts., Seattle, Zone 4, **$253,581.** CD 2/13—ENR 2/15.

CONTRACTS AWARDED

Alabama—State Hy. Dpt., Montgomery, imprv. 1.242 mi. Montgomery and Lowndes Co., to Carlton Contg. Co., Albany, Ga., **$75,277.** Bids 2/23. CD 2/14.

Ala., Birmingham—Bd. Comrs. Jefferson Co., County Court House, grading, drainage and bituminous surfacing 10.5 mi. Praco Rd., to Georgia-Alabama Road Constr. Co., Commerce Bldg., **$124,213.** Bids 2/20. C. J. Rogers, Birmingham, co. engr.

Ia., Sac City—Bd. Supervs. Sac Co., maintenance and construction graveling various roads, to Hartsell & Evans, Early, **$65,400.** Awarded 2/20. CD 2/9—ENR 2/15.

Ia., Spirit Lake—Dickinson Co., Spirit Lake, grading various secondary roads, to I. Van Buskirk, Hawarden, **$26,750.** Bids 3/1. CD 2/16—ENR 2/22.

Kan., Ulysses—City, City Hall, asphalt paving 40 blocks, to J. H. Shears & Sons, 410 E. 2 St., Hutchinson. **$88,000.**

Kan., Wichita—City, City Hall, asphalt resurfacing Douglas Ave., to H. T. Ritchie & Sons, 1820 N. Mosely St., **$40,000.** P. L. Brockway, City Hall, city engr.

N. C., Wrightsville Beach—Town, T. Russel Wood, mayor, City Hall, street paving imprvs., to F. D. Cline, Fairview Rd., Raleigh, **$35,083.** Bids 2/23. Wm. F. Freeman, High Point, engr.

Oklahoma—State Hy. Dpt., Capitol, Oklahoma City, imprv. 18 mi. Davis Co., and 43.7 mi. Garvin Co., to A. C. Shelton & Sons, Lawton, **$26,852** and **$29,991** respectively, est. $28,000 and $34,300 respectively***3.903 mi. Delaware Co., to Gaines Bros. Co., Miami, **$121,878,** est. $141,000***4.841 mi. Murray Co., to J. E. Simmons, Frederick, **$51,315,** est. $52,000. Grand Total $230,536. Bids 2/27, awarded 2/28. CD 2/13—ENR 2/15.

Alta., Edmonton—Provincial Govt., Edmonton, hardsurfacing 26 mi. roads, day labor. Approx. **$400,000.** Dpt. P. Wks., Edmonton, engrs.

Man., Winnipeg—Province of Manitoba, Winnipeg, graveling, imprv. non-trunk hy., day labor. **$80,000** voted. Dpt. P. Wks., Winnipeg, engr.

Ont., Lambeth—Westminster Twp., Lambeth, road reconstruction, day labor, **$30,000.**

Ont., Orangeville—Dufferin Co., Orangeville, graveling roads ,day labor. **$35,000.** E. M. Eagleson, Orangeville, engr. CD 1/30—ENR 2/1.

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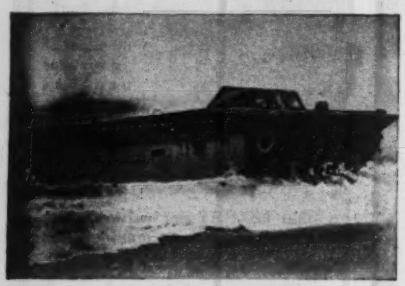
AMPHIBIOUS TRACTORS FOR SALE



One of the most useful types of war vehicles now in service with the Armed Forces, particularly in the Pacific, is the amphibious tractor known as "Water Buffalo," or LVT (Landing Vehicle, Tracked).

As the designers (in cooperation with the Bureau of Ships, U.S. Navy), engineers and manufacturers of "Water Buffalos," we of Food Machinery Corporation believe there will be a postwar market for amphibious tractors redesigned and built for *commercial* use. The purpose of this and similar advertising is to find out if we are right.

These versatile machines travel as readily on water as on land. Their amazing mechanical stability enables them to be driven through heavy seas, across reefs, onto beaches and over the roughest terrain. Hauling cargos of men, supplies and equipment, they easily negotiate swamps, jungles, rivers and rugged country impenetrable by any other vehicle. They possess extraordinary maneuverability, power and traction... turn on a dime, knock over trees, climb like mountain goats!

Now our entire output of amphibians is going to the Army, Navy and Marines. But we have published a folder containing descriptions and specifications for a commercial amphibian. We will be glad to send this folder to interested business executives who feel that their firm might have use for a postwar "Water Buffalo."

Some of the operations for which the peacetime amphibian may be suitable are:

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Mining	Lumbering
Surveying	Road construction
Rescue work in flood, ice and marshland	Equipment hauling
Flood control work	Geologic work
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Non-navigable river transportation	Mosquito control
	Coast transportation, particularly where no dock facilities are available

Probably, after reading our folder, other uses will occur to you, possibly in your own field. Write for the folder to "Water Buffalo," Food Machinery Corporation, Riverside, California.

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RIVERSIDE DIVISION, RIVERSIDE, CALIFORNIA

EARTHWORK, WATERWAYS

PROPOSED WORK

Tex., Richmond—A. Meyer, First National Bank Bldg., lake imprvs., rein.-con. embankment, spillway, dirt removal, etc. Over $16,000. Haile & McClenden, 2307 San Jacinto St., Houston, engr.

BIDS ASKED

Bids Asked March 22

†**Idaho, Coeur d'Alene**—Bureau Reclamation, Dpt. Interior, H. W. Bashore, comr., Coeur d'Alene, earthwork, concrete lining, pipelines, structures, canal and lateral sys., Post Falls Unit, Rathdrum Prairie Project, near here, Spec. 1094.

Bids Asked March 23

†**Tex., Dallas**—U. S. Eng., 231 W. Main St., Denison, levee repairs, Dallas Co. Levee Imprvt. Dist. 6-East Fork Trinity River, incl. approx. 87,850 cu. yd. embankment, and 440 m.g. sprinkling, Ser. 41-242-45-111. Extended date.

Bids Asked About March 24

†**Idaho, Coeur d'Alene**—Farm Security Admin., 950 Bway., Denver, Colo., grading 700 acres, and constructing drainage sys., laterals. $50,000 plus.

Bids Asked About March 24

†**Louisiana**—U. S. Eng., foot Prytania St., New Orleans, constructing approx. 700,000 cu. yd. uncompacted or 600,000 cu. yd. compacted earthwork, etc., Solic. No. 16-047-45-84, etc., Item L-144.2, Angelina Levee, Ponchartrain Levee Dist., St. John the Baptist Parish.

Bids Asked April 5

†**Washington**—Bureau Reclamation, Dpt. Interior, W. R. Young, ch. engr., Denver, Colo., furnishing, del. f.o.b. cars at shipping point or f.o.b. cars Odair, at option of bidder, rubber seals for floating caisson for maintenance spillway bucket of Grand Coulee Dam, Columbia Basin Project, Spec. 1798-D.

LOW BIDDERS

Calif., Los Angeles—Los Angeles Co. Flood Control Dist. and City of Los Angeles, 751 S. Figueroa St., Zone 14, storm drain from Bixby Slough to Los Angeles Harbor. $216,000. H. E. Hedger, 751 S. Figueroa St., Zone 14, engr.

CONTRACTS AWARDED

†**Louisiana**—U. S. Eng., foot of Prytania St., New Orleans, removal, disposal approx. 100,000 cu. yd. material in maintenance dredging Bayou Dupre, Violet Canal, St. Bernard Parish, Solic. No. 16-047-45-83, to Calmes Constr. Co., Louisiana National Bank Bldg., Baton Rouge, $14,500. CD 2/12—ENR 2/15.

★†**Nev., Boulder City**—Bureau Reclamation, Dpt. Interior, Boulder City, tunnel and river-channel imprvs., at Boulder Dam, Boulder Canyon Project, Arizona-California-Nevada, in Colorado River about 6 mi. northeast of here, Spec. 1089, to Guy F. Atkinson Co., 1103 Heartwell Bldg., Long Beach, Calif., $2,586,450. CD 2/2—ENR 2/8, under LB.

LATIN AMERICA

Brazil, Sao Paulo—Sao Paula Railroad, Sao Paula, plans electrification part of line to Tundiahy, 60 Kilometers. Over $300,000.

British Guiana, Georgetown — British Guiana Govt., Georgetown, plans irrigation and drainage project, $850,000. Colonial Development Bd., Georgetown, engr. CD 1/2—ENR 1/4.

British Guiana, Georgetown—British Guiana Govt., Georgetown, plans rice mill and equip. $150,000. Dpt. Industry, Georgetown, engrs.

British Guiana, Georgetown — Colonial Govt., Georgetown, plans post office. $150,000. Dpt. Works, Georgetown, archts.

British Guiana, West Berbice—Government of British Guiana, Georgetown, plans main drainage scheme, Abary-Hopetown area. Over $285,000. Dpt. of Pub. Works, Georgetown, engr.

British Honduras—Government of British Honduras, Belize, plans airfield exten. About $60,000.

B.W.I., Basseterre—Colonial Govt., Basseterre, St. Christopher, plans agricultural and animal husbandry station. £27,627. Dpt. Works, Basseterre, St. Christopher, engr.

B.W.I., Basseterre—Colonial Govt., Basseterre, St. Christopher, plans airport. $150,000.

B.W.I., Castries—Colonial Government, Castries, St. Lucia, plans airport. $150,000.

B.W.I., Grenada—Government, St. George's, plans airport. $190,000.

B.W.I., Kingston—Colonial Food Yeast Ltd., Kingston, plans by Colonial Development Bd., London, England, food yeast factory. £75,000 Sterling.

B.W.I., Kingston—Colonial Govt., Kingston, plans airport. $150,000.

B.W.I., Kingston—Government of Jamaica, Kingston, plans by Dpt. Works, Kingston, school construction, about $240,000; prison farm, about $230,000. Dpt. Works, Kingston, engr.

B.W.I., Kingston—Government of Jamaica, Kingston, plans catchments and storage tanks for drier, rural areas. About $250,000. Dpt. Works, Kingston, engr.

B.W.I., Palasadoes—Government of Jamaica, Kingston, plans exten. airfield facilities to fit airfield for use as civil airport. About $225,000. Dpt. Works, Kingston, engr.

B. W. I., Port au Spain—Trinidad Govt., Port au Spain, Trinidad, road construction, $300,000; road maintenance, $1,700,000; day labor. Dpt. Works, Port au Spain, Trinidad, engrs.

B.W.I., St. John—Colonial Govt., St. John, Antigua, plans airport. $150,000.

B. W. I., St. Raphael—Republic of Haiti, Port au Prince, Haiti, plans irrigation project involving 17,000 acres, $200,000. Food Production Bd., Port au Prince, Haiti, engrs.

Chile—Sociedad Fabrica de Cemento El Melon, Santiago, plans 100,000 ton cement plant, at **Iquique**, $150,000 plus; 100,000 ton cement plant, at **Coquimbo**, $150,000 plus. Corporacio de Fomento de la Producion, Santiago, engrs.

Chile, Antofagasta—Chile Govt., Santiago, plans fishing and canning factory, $200,000. Ministry of Economy & Commerce, Santiago, engrs.

Chile, Vina del Mar—Municipality, plans 6 story, 250 bed hospital, 15,000,000 pesos.

Colombia, Bogota—Aerovias Nacionales de Cambia, Bogota, plans airport extens. $200,000.

Colombia, Sali—Mundo Aerovias, S.A., Cali, plans airport. 500,000 pesos.

Colombia, Santa Marta—Republic of Colombia, Bogota, plans commercial airport designed to permit landing of heavy commercial transport planes which serve Caribbean Area, $450,000.

Ecuador, Bahia—Republic of Ecuador, Quito, plans water supply exten. $150,000. Ministry Pub. Works, Quito, engrs.

Guatemala, Guatemala City—Feltrin Co., Guatemala City, plans saw mill and allied plant construction. 300,000 quetzales.

PUBLIC BUILDINGS

PROPOSED WORK

★†**Ala., Tuscaloosa**—U. S. Eng., Grant St. west of Westwood St., Mobile, barracks, mess hall, recreation bldgs., administration and supply bldg., converting hospital barracks, etc., Northington General Hospital. $505,820.

†**Ark., Bearden**—Pub. Housing Auth., NHA, 1411 Electric Bldg., 7 and Lamar Sts., Fort Worth 2, Tex., plans by Wittenberg & Delony, Pyramid Bldg., Little Rock, 300 trailers, Ark. 4143.

†**Calif., Barstow** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by A. Monaco, 3021 Waverly Dr., Los Angeles 44 unit temporary family housing, Calif. 4989 N. CD 2/20—ENR 3/1.

†**Calif., Coronado (br. San Diego)**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Giberson, Adams & Smith, 113 E. Los Feliz Rd., Glendale, 40 temporary, family dwelling units, Calif. 4039 N.

†**Calif., El Centro**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by S. Wilson, 3681 6 St., Riverside, 152 temporary family dwelling units, Calif. 4028 N. CD 2/16—ENR 3/1.

†**Calif., ElToro** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by March, Smith & Powell, 516 Architects Bldg., Los Angeles, 280 unit, temporary family dwellings, Calif. 4898 N. CD 11/27—ENR 11/30.

†**Calif., Fallbrook** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Marsh, Smith & Powell, 516 Architects Bldg., Los Angeles, 40 unit temporary family dwellings, Calif. 4990 N. CD 2/16—ENR 3/1.

†**Calif., Holtville** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by S. Wilson, 3681 6 St., Riverside, 48 unit temporary family dwellings, Calif. 4046 N.

†**Calif., Inyokern** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Stafford & Gogerty, 1717 N. Vine St., Hollywood, 80 unit temporary family dwellings, Calif. 4991 N. CD 2/16—ENR 3/1.

†**Calif., Long Beach**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Parkington, Lyndon & Wing, Architects Bldg., Los Angeles, 192 unit temporary family dwellings, Calif. 4992 N. CD 2/16—ENR 3/1, under Los Angeles.

†**Calif., Mojave** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by A. Monaco, 3021 Waverly St., Los Angeles, 40 unit temporary family dwellings, Calif. 4993 N. CD 2/16—ENR 3/1.

†**Calif., Oceanside**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Risley, Gould & Lodge, 220 S. Westmoreland St., Los Angeles, 200 unit temporary family dwelling units, Calif. 4994 N. CD 2/16—ENR 3/1.

†**Calif., Oxnard** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Soule & Murphy, 116 E. Sola St., Santa Barbara, 80 unit temporary family dwellings, Calif. 4054 N.

†**Calif., Palm Springs**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by S. Wilson, 3681 6 St., Riverside, 25 unit family dwellings, Calif. 4985. CD 2/8—ENR 2/15.

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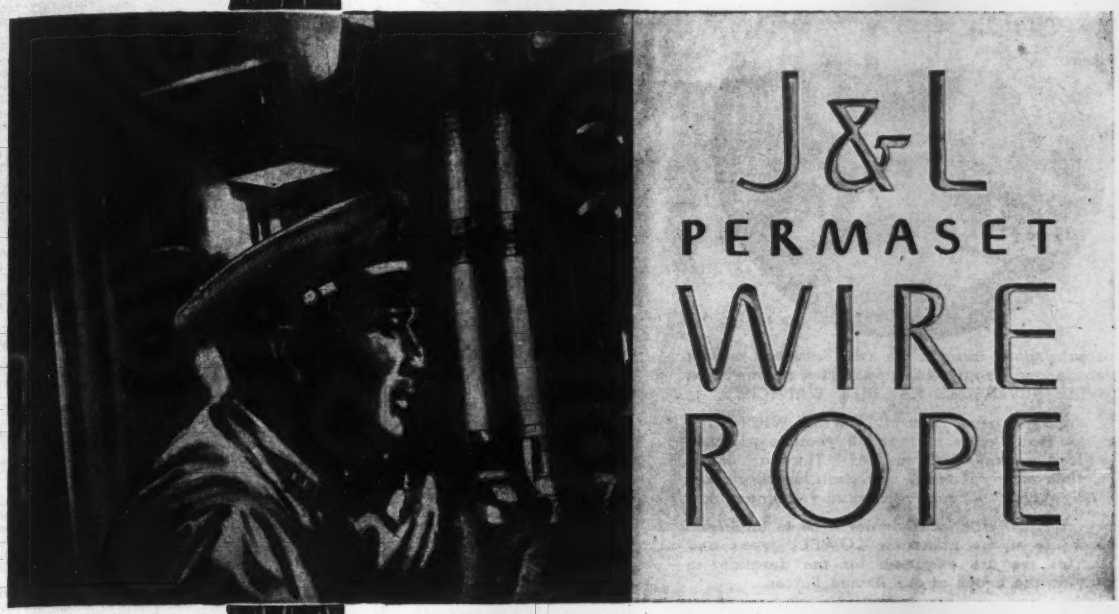

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PUBLIC BLDGS. (Proposed Work, Contd.)

†**Calif., San Diego**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Wilson, Hope & Criley, 607 Architects Bldg., Los Angeles, 240 unit temporary family dwellings, Calif. 4037 N and 44 unit family dwellings, Calif. 4038 N.

†**Calif., San Diego**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Giberson, Adams & Smith, 113 E. Los Feliz Rd., Glendale, 96 temporary family dwelling units, Calif. 4040 N and 80 temporary family dwelling units, Calif. 4997 N; plans by Weston, Reichardt & Johnson, 1755 S. Bway., Los Angeles, 200 temporary family dwelling units, Calif. 4996 N; plans by Bodmer, Wurdeman & Becket, 6536 Sunset Blvd., Los Angeles, 400 temporary family dwelling units, Calif. 4995 N. CD 2/16—ENR 3/1.

†**Calif., San Pedro**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Wing & Brout, Architects Bldg., Los Angeles, 40 unit temporary family dwellings, Calif. 4050.

†**Calif., Santa Barbara**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, plans by Soule & Murphy, 116 E. Sola St., Santa Barbara, 76 unit temporary family dwellings, Calif. 4527 N. CD 2/16—ENR 3/1.

†**Calif., Vacaville** — Pub. Housing Auth., NHA, 760 Market St., San Francisco, 44 unit family dwellings, Calif. 4058.

†**Colo., Camp Carson (br. Colorado Springs)**—U. S. Eng., 909 17 St., Denver, addnl. hospital construction. $20,000.

†**Colo., Pueblo**—U. S. Eng., 909 17 St., Denver, converting depot barracks into 60 dormitory for war workers, $100,000.

★**Conn., Cheshire**—Bd. Educ., Town Hall, plans by D. Orr, 96 Grove St., New Haven, high school. $500,000.

†**Ga., Camp Gordon (br. Augusta)**—U. S. Eng., Post Office Bldg., Savannah, rejected bids Feb. 15, disciplinary barracks, GOR-9-45. Will readvertise.

★†**Ill., Ottawa**—Inland Rubber Co., Ottawa, plant. $7,000,000. Defense Plant Corp. will finance.

La., Alexandria—City, City Hall, installing frozen food locker plant and cold storage unit, $50,000. Soule Butler, Alexandria, engr.

†**La., New Orleans**—Consolidated Vultee Aircraft Corp., 2202 Pacific Hy. San Diego, Calif., addnl. plant bldg. $400,000. Defense Plant Corp. will finance.

★†**Mich., Fort Custer (br. Battle Creek)**—U. S. Eng., 408 Federal Bldg., Milwaukee, Wis., convalescent hospital, recreation bldg., outdoor athletic facilities, altering existing bldgs., Percy Jones General Hospital. $1,205,000.

★†**Mich., Grand Rapids** — Doehler-Jarvis Corp., Grand Rapids, plans being completed 1 story, brick, steel, rein.-con., plant $2,500,000. Defense Plant Corp. will finance.

Mich., Whitehall—Bd. Educ., Whitehall, plans by O'Dell, Hewlett & Luckenbach, 2327 Dime Bank Bldg., Detroit, brick, steel, concrete school. $450,000.

★†**Miss., Flora**—U. S. Eng., Grant St., west of Westwood St., Mobile, Ala., reactivation propellant loading bldg. at Mississippi Ordnance Plant. $2,040,000.

★**N. J., Fort Dix (br. Trenton)**—U. S. Eng., 120 Wall St., New York 5, N. Y., bids soon reception center, separation center, etc. $530,000.

†**N. Y., Greenhaven**—U. S. Eng., 120 Wall St., New York, Zone 5, rejected bids Jan. 16, recreation bldg. and motor maintenance shop, $150,000. Will readvertise. CD 1/15—ENR 1/25, under LB.

†**N. Y., Schenectady**—U. S. Eng., 120 Wall St., New York, Zone 5, bids soon prefabricated steel shop facilities, at Service Center, $100,000. CD 2/7—ENR 2/15.

★†**O., Massillon**—Hoover Co., North Canton,, altering former Ft. Pitt Bridge Works plant, providing facilities for expanding output of shell and mortar fuses. $50,000. Defense Plant Corp. will finance.

†**Okla., Chickasha**—Veterans Admin., Vermont Ave., between H and I Sts. N. W., Wash. 25, D. C., Borden General Hospital addn. $250,000.

★†**Pennsylvania** — Veteran's Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, general and tuberculosis hospital, 1200 bed capacity, $6,821,072; psychiatric hospital, 1,800 bed capacity, $6,723,340, both in western Pennsylvania.

★**S. C., Charleston**—Medical Society of South Carolina, Charleston, plans by Samuel Hannaford & Sons, 1024 Dixie Terminal Bldg., Cincinnati, O., 2 wings to 3 story hospital, incl. new power house and laundry bldg. $1,800,000.

†**Tex., El Paso**—U. S. Eng., Albuquerque, N. M., addnl. bldgs., facilities for WAC occupancy. $150,000.

†**Tex., San Antonio**—U. S. Eng., Fort Sam Houston, revising plans bldg. alterations, addns. for A. G. and S. F. redistribution station, Serial No. W-41-154-45-73. Over $150,000. Bids 2/20 postponed.

★†**Tex., Sunray**—Continental Carbon Co., 17 Park Pl., New York, N. Y., addnl. mfg. bldg. at Carbon Black Plant. $600,000. Defense Plant Corp. will finance. CD 1/30—ENR 2/1.

★**Wash., Bremerton**—School Bd., Bremerton, plans by Naramore, Bain, Brady & Johanson, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, school bldgs., West Sheridan and View Ridge, school addn., at East Bremerton and Manette, $740,000. FWA funds being sought.

BLIC BLDGS. (Proposed Work, Cont'd.)

Wash., Spokane—U. S. Eng., 800 3 Ave., ttle, Zone 1, converting barracks into spital wards, constructing barracks and reation bldg. for WAC at Baxter Gen- l Hospital. $255,000.

Alta., Edmonton—Municipality, plans by Dewar, City Hall, power plant. $100,000.

Alta., Edmonton—Royal Alexandria Hos- al Bd., plans by M. Dewar, City Hall, ysic treatment hospital, rotunda to pro- de waiting space and other facilities. 0,000.

Alta., Edmonton—University of Alberta, dmonton, plans by Rule-Wynn & Rule, Birks Bldg., Edmonton, library, dental d medical bldg. exten. Over $150,000.

Alta., Edmonton—University of Alberta, dmonton, plans by Rule-Wynn & Rule, 254 rks Bldg., altering men's residence at the habasca and Assiniboia Halls, etc.

Alta., Edmonton — Wartime Housing, Ltd., 55 York St., Toronto, Ont., 400 uses. About $1,500,000-$1,750,000.

Alta., Mayortherpe—Municipality, plans by le-Wynn & Rule, 254 Birks Bldg., Ed- nton, hospital. $150,000.

Alta., Ponoka—Municipality, plans by Rule- nn & Rule, 254 Birks Bldg., Edmonton, spital. $150,000.

Man., Winnipeg—Wartime Housing, Ltd., 55 York St., Toronto, Ont., 200 addnl. uses. About $750,000.

N. B., Sussex—King's County General spital Bd., Sussex, hospital. $150,000.

N. S., Glace Bay—Bd. School Comrs., Glace y, high school. $185,000.

N. S., Kentville—Province of Nova Scotia, c/o Ministry of Health, Halifax, sanato- m bldg. $1,000,000. Dpt. P. Wks., Halifax, chts. CD 3/22.

Ont., Sudbury — Public School Bd., J. wler, secy., plans by L. N. Fabbra, 590 ris St., school, Van Horne St. Over $250,- 0.

Ont., Weston—Toronto Hospital for Con- mptives, 14 Buttonwood Ave., plans by thers & Haldenby, 96 W. Bloor St., To- nto, hospital addn. $150,000.

Ont., Windsor—General Hospital Bd., City ll, general hospital addn. $450,000.

Que., Quebec City—Quebec Catholic School mm., Quebec City, plans by L. T. Des ivereis, school for St. John the Baptist rish, St. John and Simard Sts. $150,000.

DS ASKED

Bids Asked March 12

†Va., Fort Story (br. Virginia Beach)—ub. Housing Auth., NHA, Georgia Savings nk Bldg., Peachtree and Broad Sts., tlanta 2, Ga., site improvs., 34 traile- using maintenance bldg., utilities, Va. 343.

Bids Asked March 14

†Neb., Hastings—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., ash. 25, D. C., magazine bldgs., at Naval upply Depot. $8,000,000. Graham, Anderson, robst & White, Railway Exchange Bldg., hicago, Ill., archts.

†W. Va., Morgantown—Monongalia Gen- al Hospital, Morgantown, nurses home, . Va. 46143. $70,000. FWA. L. D. Schmidt. rofessional Bldg., Fairmont, archt. CD 2/5—NR 2/8.

Bids Asked March 15

†Ga., Warner Robins—Federal Works gency, 20 5 St. N.E., Atlanta, reconstruct- g fire damage to complete recreation cen- r, GA. 9-133 F. Plans deposit $5.

†Tex., Harlingen—Pub. Housing Auth., HA, 1411 Electric Bldg., 7 and Lamar s., Fort Worth, Zone 2, 300 unit family iler housing, Tex. 41692. Plans deposit 5. Hedrick & Lindsley, 811 Southern tandard Bldg., Houston, archts. CD 20—ENR 3/1.

Bids Asked March 16

†D. C., Wash.—U. S. Eng., 1 and Douglas a. N.W., Wash. 25, building over existing wimming pool, Walter Reed Hospital. 50,000.

Bids Asked March 19

N. Y., New York—New York City Housing uth., 122 E. 42 St., Zone 17, demolition of ructures for James Weldon Johnson Hous- s, E. 113 to E. 115 Sts., Park to 3 Aves., YS-21. Plans deposit $10.

B. C., Victoria—Secy. Dpt. P. Wks., Otta- a, Ont., veterans hospital. About $350,000- 00,000. C. D. Sutherland, c/o owner, and ercer & Mercer, 615 West Hastings St., ancouver, archts.

Bids Asked March 20

Ore., The Dalles—Port of the Dalles, The alles, H. G. Miller, secy., Port Comm., rain elevator, grain storage annex, con- ete. $100,000. Plans deposit $50.

Bids Asked March 21

†Ga., Dublin—Yards & Docks, Navy Dpt., St. and Constitution Ave. N.W., Wash. D. C., 400 bed expansion, personnel bldg., aval Hospital, Spec. 15966, NOY 11667. CD 21.

Bids Asked March 21

Minn., Austin—City, Bd. Water, Electric, ht & Power Comrs., W. D. Dunlap, secy., unicipal power plant boiler room changes d addns. $40,000. Plans deposit $20. aimick, Edeskuty & Lutz, 412 Essex Bldg., nneapolis, engrs. CD 1/25—ENR 2/1.

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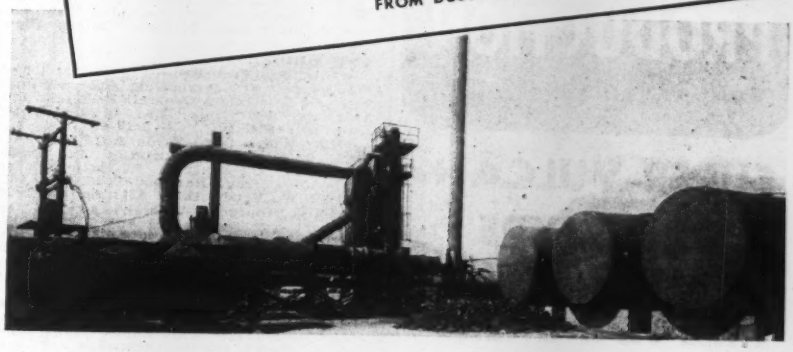

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PUBLIC BUILDINGS (Bids Asked, Cont'd.)

Bids Asked March 22

†**N. M., Deming**—Pub. Housing Auth., NHA, 1411 Electric Bldg., 7 and Lamar Sts., Fort Worth 2, Tex., 25 unit family trailer housing, N.M. 29187. Plans deposit $25. W. C. Kreuger, Sena Plaza, Santa Fe, archt. CD 2/8—ENR 2/15.

Bids Asked March 23

†**Ark., Bearden**—Pub. Housing Auth., NHA, 1411 Electric Bldg., 7 and Lamar Sts., Fort Worth 2, Tex., 300 unit trailer housing, Ark. 3143. Plans deposit $25. Wittenberg & Deloney, Pyramid Bldg., Little Rock, archts. CD 3/1.

Bids Asked March 23

†**D. C., Wash.**—Federal Works Agency, 18 and F Sts. N.W., Zone 25, Federal Office Bldg. 5 addn. CD 1/2—ENR 1/4.

Bids Asked

†**Conn., Avon**—U. S. Eng., 31 St. James Ave., Boston, Mass. (selected list bidders), bldgs., No. 19-023-45-Neg-98. $18,000.

†**Mass., Fort Devens (Sta. Ayer)**—U. S. Eng., 31 St. James Ave., Boston (selected bidders) service club, No. 19-023-45-Neg-97.

★†**Tex., Houston**—McEvoy Co., 600 Milby St., converting Ford Assembly Plant into new ordnance plant. $400,000. Defense Plant Corp. will finance.

LOW BIDDERS

†**Calif., San Francisco**—U. S. Eng., 74 New Montgomery St., gymnasium and swimming pool at Letterman General Hospital, Jobs 1932 and 1943, from Theo. G. Meyer, 200 Quint St. $215,562. CD 2/19.

†**Md., White Oak**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., Feb. 28, boiler house, NOY 11811, from Harwood-Nebel Co. 1520 K St. N.W., Wash., D. C., $241,000. CD 2/20.

★†**Miss., Gulfport**—Veteran's Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., Feb. 20, addnl. hospital bldgs. facilities, utilities, etc., from L. F. Favret Constr. Co., 937 Gravier St., New Orleans, La., $511,316. (Correction—low bidder). CD 2/23—ENR 3/1, under LB.

★†**Wash., Renton**—U. S. Eng., 800 3 Ave., Seattle, Zone 4, Feb. 26, two 200x825 ft., frame warehouses with timber piling fdns., railroad spurs, sanitary sewerage sys., etc., at Boeing Aircraft Co. plant, Neg. 1095, from A. F. Mowat Constr. Co. & John H. Sellen Constr. Co., 2833 Eastlake Ave., Seattle, Zone 2, $664,228.

†**Wash., Walla Walla**—U. S. Eng., Pittock Blk., Portland, Ore., Feb. 21, McCaw Hospital addn., from A. Ritchie & Co., Box 253, $210,506.

CONTRACTS AWARDED

†**Ala., Ensley (sta. Birmingham)**—U. S. Eng., Grant St. west of Westwood St., Mobile, design, supervision and construction 75 mm sheet forging plant, presently known as Easley-Rheem plant, to Rust Engineering Co., Liberty Natl. Life Bldg., Birmingham. $220,000.

†**Ala., Tuscaloosa**—U. S. Eng., Grant St. west of Westwood St., Mobile, hospital expans., incl. outside utilities at Northington General Hospital, to Day & Richardson, 429 S. 24 St., Birmingham, $300,000.

†**Calif., Auburn**—U. S. Eng., 1209 8 St., Sacramento, Zone 8, WAC and medical detachment house, paving, utilities, at De Witt General Hospital, Spec. 1048, to H. W. Robertson, 2917 T St., Sacramento, $218,239.

†**Colo., Colorado Springs**—U. S. Eng., 909 17 St., Denver, converting 8 to 10 bldgs., for hospital to Jas. B. Kenney, 582 High St., Denver. Est. $300,000. CD 2/20—ENR 3/1.

†**Ind., Crane**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., lunch and locker bldg. for new projectile loading area, Naval Ammunition Depot, NOY 10788, to Sumner S. Sollitt & Co., 307 N. Michigan Ave., Chicago, Ill. $170,200.

†**Kan., Topeka**—U. S. Eng., 10 E. 17 St., Kansas City, Mo., 20 bldgs., incl. barracks, recreation halls, mess halls, warehouses, social therapy bldg., at Winter General Hospital, to Martin K. Eby Constr. Co., 311 E. Murdock St., Wichita. $436,474.

†**Miss., Jackson**—U. S. Eng., Grant St. west of Westwood St., Mobile, Ala., hospital expansion, incl. outside utilities, Foster General Hospital, to C. H. Treadwell 1523 Centenary Blvd., Shreveport, La. $321,353.

★†**Nev., Hawthorne**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., low cost housing and print shop, Naval Ammunition Depot, NOY 11678, to Johnson, Drake & Piper, Inc., 1736 Franklin St., Oakland, Calif., $635,990. CD 2/26, under LB.

†**N. Y., Yaphank**—U. S. Eng., 120 Wall St., New York, Zone 5, addnl. hospital bldgs. to James King & Sons, Inc., 350 Fifth Ave., New York, Zone 1. Est. $275,000-$500,000. CD 2/23—ENR 3/1.

†**Pa., McKees Rocks**—Continental Can Co., C. C. Conway, pres., 100 E. 42 St., New York, N. Y. (M. W. Smith, proj. engr. and in charge, Munson Ave., McKees Rocks) 1 story, 100x243 ft., brick, steel, forge plant, 10 ton crane runway, compressor and generator room, to Siesel Constr. Co., Flannery Bldg., Pittsburgh, bldg. $115,000. Total $750,000 incl. equip. Defense Plant Corp. will finance. Marks & Simboli, Grogran Bldg., Pittsburgh, archts. CD 1/30—ENR 2/1.

COMMERCIAL BUILDINGS

PROPOSED WORK

Calif., Oakland—E. W. McGah & J. F. O'Shea, 105 Ave. and Edes St., 43 frame residences. $225,000.

Md., Baltimore—Provident Hospital, 15[illegible] Division St., sketches by A. D. Cassell, 1[illegible] 14 St. N.W., Wash., D. C., nurses' home $150,000. Applying for FWA funds.

Tex., Raymondville—W. L. Rockey, Raymondville, thirty 1 story, frame, sheet roof residences, $160,000. Applying to FHA.

N. B., Moncton—Moncton Hospital Board, King St., Geo. W. Spencer, chn., Empire Blk., Main St., A. Wheeler, pres., 21 Weldon St., 1 story, on new section hospital addn. on original bldg., providing 100 beds, $200,000.

N. B., Moncton—F. W. Woolworth Co. Ltd., 21 Main St., department store. $150,000.

Ont., Hamilton—National Trust Co., Ltd., 225 St. James St. W., Montreal, Que., 1 story, 80x120 ft., stone office bldg. $175,000.

Ont., Ottawa—LaSalle Academy, c/o Rev. Brother Quintellien, Sussex and Singues Sts., academy addn. $250,000.

Ont., Toronto—Huron & Erie Mortgage Corp., 112 Yonge St., banking and trust offices with safe deposit vaults on street level.

Ont., Windsor—Huron & Erie Mortgage Corp., M. Aylesworth, genl. mgr., G. L. Spry, advt. mgr., Huron and Erie Bldg., Dundas St., London, office. $300,000-$400,000.

Que., Chicoutimi—Gagnon Brothers, Racine St., commercial bldg. $150,000.

LOW BIDDERS

Mo., St. Louis—St. Joan of Arc Catholic Church, Rev. M. F. Cronin, pastor, 5[illegible] Pernod St., Zone 9, 3 story, part 1 story, 60x180 ft., stone veneer and rein.-con. school addn., existing portion 1 story, 60x75 ft., enlarging present chapel on ground floor, etc., from C. Rallo Contg. Co., 4541 S. Louis Ave. $157,179. H. P. Hess, 100 Ambassador Bldg., 411 N. 7 St., Zone 1, archt. CD 2/12—ENR 2/15.

★**Tex., Orange**—E. I. duPont de Nemours & Co., duPont Bldg., Wilmington, Del., huts and trailer units, $500,000; public school bldg., store bldg., and other community facilities, $300,000. CD 2/27—ENR 3/1.

CONTRACTS AWARDED

★**Ill., Chicago**—Chatham Village Const. Co., c/o C. J. Kastrup, archt., 7[illegible] Madison St., Forest Park, 116 single family dwellings between 100 and 103 Sts. on west side of Maplewood and east side of Talman between 99 and 103 Sts. Owner builds, $800,000, incl. land.

Pa., Erie—Isaac Baker & Son, 7 and State Sts., 2 story, bsmnt., 42x165 ft., stone, brick store, to Henry Shenk Co., 1115 Sassafras St. Est. $150,000. G. B. Mayer, 1030 Schofield Bldg., Cleveland, O., archt. H. Joyce, 616 Commerce Bldg., engr.

Tex., Houston—Dow J. Zabolio, 2301 Ella Lee Lane, 2 story, concrete, brick, shell rock, etc., apartment, day labor, $200,000. J. Knostman, 2017 W. Gray Ave., archt.

Tex., Houston—San Jacinto, 510 Witte St., 8 apartment and duplex, brick veneer concrete bldgs., 28 units, force account, $200,000. J. W. Knostman, 2017 W. Gray St., archt. CD 2/28.

★**Alaska, Anchorage**—A. E. Lathrop Co., Anchorage, steel, concrete theatre, 4 St. to W. Hufeisen, Anchorage. Est. $[illegible] B. Marcus Priteca, Palomar Bldg., 1 and University Sts., Seattle 1, Wash., archts.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Calif., Los Angeles—FACTORY—The Elper California Co., 4200 E. Alameda St., rebuilding plumbing equip. factory, destroyed by fire. Over $40,000.

★**Calif., Sausalito** — CANNERY — V. E. Alioto, c/o Natalie J. Holly, atty., Cheda Cheda Bldg., San Rafael, plans by R. E. Jones, P. O. Box 927, Carmel, 150 x 250 ft. sardine and tuna cannery on 240 x 400 ft. water block site, involving dredging, piling, fill-in, etc. $1,000,000. W. E. Cathie, 69 Mission St., San Francisco, engr. CD 2/15—ENR 2/15.

Conn., Cos Cob—POWER PLANT—New York, New Haven & Hartford R. R. Co., E. H. Oviatt, ch. engr., Water St., New Haven, bids soon altering power station, $300,000. Gibbs & Hill, Inc., 470 7 Ave., New York N. Y., engr. CD 2/21—ENR 3/1.

★**Conn., Norwalk** — FACTORY — Norwalk Tire & Rubber Co., Winnipauk, Norwalk, rein.-con. factory, to E. & F. Constr. Co., 94 Wells St., Bridgeport. Est. $350,000. Fletcher Thompson, Inc., 211 State St., Bridgeport, engr. CD 2/15—ENR 2/22.

La., New Orleans—PLANT—Frank Higgins, c/o Higgins Aircraft Corp., Higgins Plant. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., engrs.

Mass., Braintree — PLANT — Armstrong Cork Co., Hancock St., soon lets contract, 1 story, brick concrete plant addn., Hancock St. Over $40,000.

INDUSTRIAL BLDGS. (Proposed Work, Cont'd.)

Mass., Springfield—WAREHOUSE—W. E. Hibble, archt., 25 Harrison Ave., soon lets contract, brick, steel warehouse, for Charles F. Lewis Co., 401 Liberty St., $50,000.

N. J., Elizabeth—WAREHOUSE—Breeze Corp. of America, 500 Central Ave., Newark, plans by S. Spawn, 500 Central Ave., Newark, warehouse alterations, incl. sprinkler sys., new partitions, etc. $40,000.

N. Y., Whitesboro—PLANT—Utica Drop Forge & Tool Corp., 2415 Whitesboro St., plant alterations, addns. $200,000.

Ore., Salem—PLANT—Kelly, Farquhar & Co., Front and Norway Sts., plans by L. P. Bartholomew, 129 N. Commercial St., 1 story, 96 x 320 ft., cold storage plant, rein.-con. $85,000.

Pa., St. Marys — MANUFACTURING — Blackpole Carbon Co., J. O. Wittman, in charge constr., 201 Tannery St., plans completed by C. S. Kirby, 606 Commerce Bldg., Erie, two 1 story, 50x80 ft., brick, rein.-con. mfg. bldgs. $75,000.

Tex., Dallas—SHOP, etc.—Bankston-Hall Motors, 2311 Main St., plans by R. Goodwin, Construction Bldg., and bids soon 1 story, semt., 240 x 300 ft., brick, steel, rein.-con., mechanical shop and storage bldg. $150,000.

Tex., Dallas—PLANT—E. C. Paige, et al, 1434 S. Harwood St., metal products mfg. plant, $40,000.

Tex., Houston—PLANT—Shell Oil Co., Shell Bldg., 100-octane aviation gasoline mfg. plant, $9,000,000.

Tex., Longview—MACHINE SHOP—Lebus Rotary Tool Works, Longview, reconstructing machine shop. Over $100,000.

Tex., Mercedes—PLANT—Associated Growers of Mercedes, Mercedes, 1 and 2 story, citrus and vegetable packing plant, brick, rein.-con., metal. $48,000.

Tex., Mercedes—PLANT—Saladino Box & Crate Co., Mercedes, rebuilding crate mfg. plant, $40,000.

Tex., San Antonio — FACTORY — Mission Concrete Pipe Co., 1519 Hoefgen Ave., bids soon 1 story, rein.-con., precast concrete block factory bldg. $40,000.

Wash., Everett—PLANT—Weyerhaeuser Timber Co., bleach plant with steel-framed roof. $587,100.

Wash., Seattle—WAREHOUSE—A. M. Castle & Co., 2600 W. Spokane St., Zone 6, plans by Naramore, Bain, Brady & Johanson, Smith Tower, 2 and Yesler Sts., Zone 4, and bids soon 140 x 460 ft. steel distributing warehouse, 3648 E. Marginal Way, $180,000. CD 8/17—ENR 8/24.

Alaska, Fairbanks — LAUNDRY — Fairbanks Laundry Co., Fairbanks, plans by A. A. Shay, Skinner Bldg., 5 and Union Sts., Seattle 1, Wash., 1 story, 70x90 ft., rein.-con. laundry. $60,000. S. Ivarsson, Skinner Bldg., 5 and Union Sts., Seattle 1, Wash., engr.

Alta., Edmonton—GARAGE, etc.—Edmonton Motors, Ltd., Edmonton, plans by Rule-Wynn & Rule, 254 Birks Bldg., garage and repair shop. $75,000.

Alta., Edmonton—PLANT—Palm Dairies, Ltd., Edmonton, made plans ice cream and dairy product mfg. plant. $40,000.

B. C., Port Alberni—PLANT—Bloedel-Stewart & Welch, Ltd., 1411 4 Ave. Bldg., Seattle 1, Wash., sulphate pulp plant. $6,000,000. H. A. Simons, 1331 3 Ave. Bldg., Seattle 1, Wash., engr. CD 2/5—ENR 2/8.

B. C., Port Alberni—MINING DEVELOPMENT—Cangold Mining & Exploration Co., Ltd., Port Alberni, mining development on Sherwood property, 36 mi. northwest of here. $100,000.

B. C., Port Alberni—MINE DEVELOPMENT—Good Hope Mines, Ltd., Port Alberni, tunnelling, erection, etc., on mine development, foot of Della Falls, at Della Lake. $250,000.

B. C., Prince George—SAW MILL, etc.—Six Mile Lake Sawmills, Ltd., Prince George, saw mill and allied plant construction.

Man., Brandon—FACTORY—Currie Mfg. Co., Inc., McTavish and 9 Sts., factory. $40,000.

Man., Winnipeg — FACTORY — Chappell Sash & Door Co., Inc., 1908 Main St., sash and door factory. $40,000.

Man., Winnipeg—MACHINE SHOP, etc.—F. Robillard, 822 St. Matthew Ave., machine shop and repair shop. $40,000.

North West Territory, Yellowknife—MINING DEVELOPMENT—Gotham Yellowknife Mines, Ltd., Yellowknife, development of Gotham properties. $30,000. C. R. Carson, c/o owner, engr.

Ont., Belleville—PLANT—Modern Cleaners & Dyers Ltd., c/o F. G. Cushing, K. C. Belleville, cleaning and dyeing plant. $40,000.

Ont., Chatham — WAREHOUSE — Massey Harris Co. Ltd., J. S. Duncan, genl. mgr., 915 King St. W., Toronto, distribution warehouse, Wellington and Adelaide Sts. $50,000.

BIDS ASKED

Bids Asked March 17

La., Bunkie—FARM IMPLEMENT—J. Myers, 512 Guaranty Bldg., Alexandria, farm implement bldg., on Hy. 71. Plans deposit $10. M. J. Heinberg, 512 Guaranty Bldg., Alexandria, archt.

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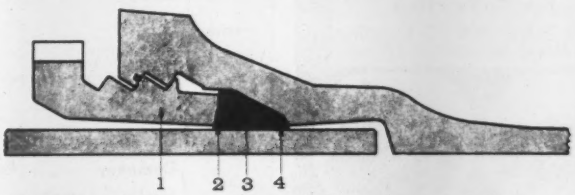

Illustration: **Cross Section of Screw Gland Joint**

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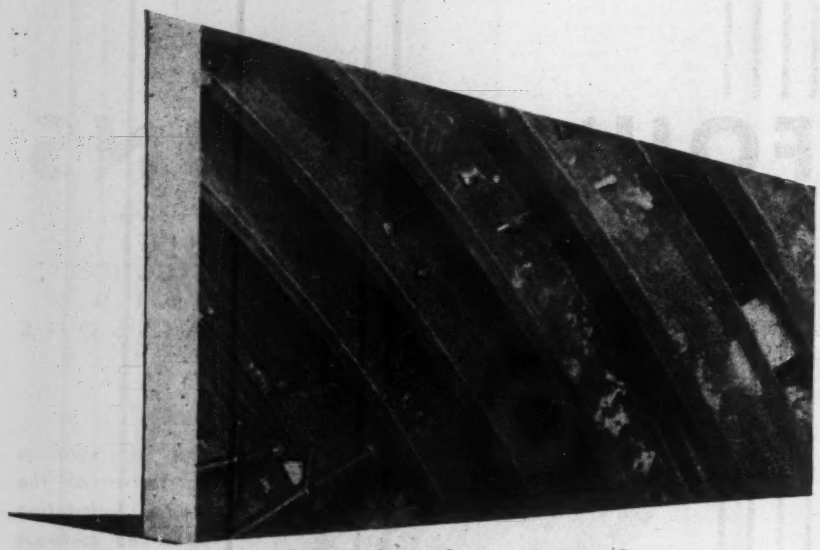

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INDUSTRIAL BLDGS. (Bids Asked, Cont'd.

Bids Asked in March

Conn., Hartford—SERVICE GARAGE—Owner, c/o Kane & Fairchild, archts., Pearl St., 1 story, 45 x 100 ft., brick service garage, 40 x 100 ft. wing. CD 1/9—ENR 1/11.

Ore., Heppner—KILN BUILDINGS—Heppner Lumber Co., Heppner, bldgs. to house kilns for drying lumber. $40,000.

Bids Asked About March 15

R. I., Central Falls—PLANT UNIT—General Products Co., 15 Elbow St., Providence, plans by Dwight Seabury Co., 188 Main St., Pawtucket, 2 story, brick, steel engineered plant unit.

Bids Asked in June

N. H., North Rochester—PLANT—Spaulding Fibre Co., Inc., North Rochester, re- building brick, steel plant, damaged by fire. Over $40,000. F. L. Smith, 21 E. 40 St., New York, N. Y., archt. CD 12/28—ENR 1/4.

Bids Asked

★**Ky., Frenchburg**—COMPRESSOR STATION—Tennessee Gas & Transmission Co., Commerce Bldg., Houston, Tex., compressor station, near here, $1,250,000. CD 3/2.

★**Miss., Greenville**—COMPRESSOR STATION—Tennessee Gas & Transmission Co., Commerce Bldg., Houston, Tex., compressor station, near here, $1,250,000. CD 3/2.

★**Tenn., Middleton**—COMPRESSOR STATION—Tennessee Gas & Transmission Co., Commerce Bldg., Houston, Tex., compressor station, near here, $1,250,000. CD 3/2.

★**Tenn., Springfield**—COMPRESSOR STATION—Tennessee Gas & Transmission Co., Commerce Bldg., Houston, Tex., compressor station, near here, $1,250,000. CD 3/2.

Tex., Orange—PLANT—Kemso Chemical Products, Inc., 1203 Milby St., Houston, 45x180 ft. and 20x80 ft., steel bldgs., galvanizing plant. $75,000. CD 2/21—ENR 3/1.

LOW BIDDERS

Ore., Warrenton — WAREHOUSES — Bio-Products, Ltd., Astoria, Feb. 28, 2 warehouses, from J. Helstrom, 649 Jerome Ave., Astoria, $61,220. CD 12/12—ENR 12/14.

CONTRACTS AWARDED

Calif., Delano—ICE PLANT—John Chinello & Assoc., Bank of America Bldg., Fresno, 83 x 108 ft., ice plant, metal, to Taylor & Wheeler, 245 Clinton St., Fresno $56,228.

Calif., Vernon — FACTORY — Union Die Casting Co., 2313 E. 51 St., reconstructing 1 and 2 story, 130 x 200 ft., steel frame, corrugated iron factory bldg. destroyed by fire, to Ryan A. Grut, 318 W. 9 St., Los Angeles, approx. $75,000. L. Squires, Douglas Bldg., Los Angeles, archt.

Mass., Fall River—FOUNDRY—Excel Foundry & Machine Co., 2 Lawton St., foundry bldg. addns., Jefferson St., to Fred J. Rudd Constr. Co., Weetamoe St., approx. $50,000.

★**Minn., Brainerd**—CAR REPAIR SHOPS—Northern Pacific Ry. Co., B. Blum, ch. engr., 176 E. 5 St., St. Paul, Minn., general contract superstructure car repair shops, incl. 180 x 575 ft. main bldg., masonry, 100 x 278 ft., steel, concrete material warehouse, etc., to Al Johnson Constr. Co., 400 Foshay Tower, Minneapolis. Est. $1,500,000. Bids 2/20. CD 2/14—ENR 2/22.

Mo., Cabool—PLANT—Missouri Farmers Assn., c/o Producers Produce Co., 601 N. Main St., Springfield, milk drying plant, to W. W. Johnson, Phelps Grove, approx. $400,000.

Mo., St. Louis—FACTORY—Paraseal Corp., 4215 Clayton Ave., Zone 10, 2 story, 81 x 1[illegible] ft., brick, concrete factory addn., to Woermann Constr. Co., 2800 W. Pine Bldg., Zone 8. Est. $40,000 with equip. N. I. Bailey, 4215 Clayton Ave., Zone 10, archt.

Ore., Elgin—WAREHOUSE, etc.—Union County Grain Growers, Inc., La Grande, frame grain storage warehouse and elevator, to Western Builders, The Dalles, $45,888.

Pa., Johnstown—MANUFACTURING—Ar- Reduction Sales Co., Mr. Large, in charge, 60 E. 42 St., New York, N. Y., 1 story, 5[illegible] ft., brick, steel mfg. bldg., incl. cooling tower, control house and gas storage lines, to Wilson Constr. Co., Schenkemeyer Bldg., $287,100, incl. equip., cost plus. CD 2/13—ENR 2/15.

Pa., Meadville—PLANT—David Meade Distilling Co., M. Leff, chg., Race St., alcohol producing plant addn., alteration and equip., to J. M. Baldwin, Whitfield Bldg., Pittsburgh. Est. $100,000. J. Brewlove, Leader Bldg., Cleveland, O., consult. engr.

★**Tex., Dallas** — FACTORY — Standard Branda, Inc. 2306 Amelia St., 2 story, basmnt., brick, steel, rein.-con., factory bldg., to Inge Constr. Co., Inc., 2326 N. Beckley St., approx. $2,000,000. Tentative award. Jemison & Merrell, Construction Bldg., archts. CD 2/23.

★**Tex., Orange**—PLANT—E. I. duPont de Nemours & Co., duPont Bldg., Wilmington, Del., nylon salt plant, force account, $30,000,000. CD 2/27—ENR 3/1.

Tex., Raymondville—PLANT—Delta Canning Co., Raymondville, 1 and 2 story, 66 x 100 ft., citrus and vegetable canning plant, clay tile, concrete, force account, $45,000. Julian & White, 2901 Transit Tower, San Antonio, archts. CD 2/27—ENR 3/1.

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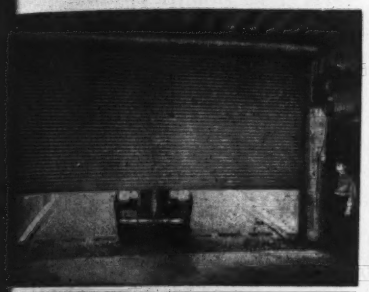

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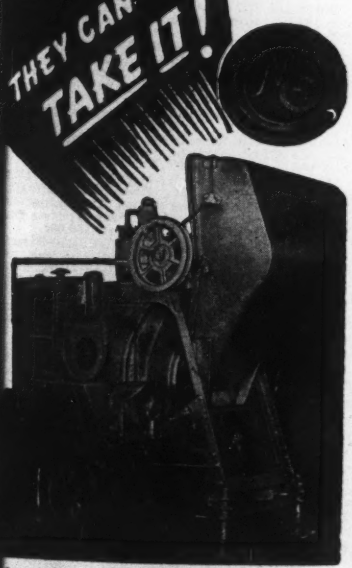

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INDUSTRIAL BLDGS. (Contracts Awarded, Cont'd.)

Tex., Tulia — ELEVATOR — Tulia Wheat Growers, Inc., Tulia, 300,000 bu. rein.-con. elevator, force account. **$60,000.** CD 2/21—ENR 3/1.

Utah, Ogden—PLANT—Weber Central Dairy Assn., Ogden, dairy products processing plant, to E. S. Paul, 1463-32 St. Bids 2/9. CD 2/12—ENR 2/15.

Wis., Wausau — FOUNDRY — Marathon Electric Mfg. Co., E. Randolph St., 1 story, 60 x 140 ft., brick, steel foundry, concrete fdn., day labor. Oppenhamer & Obel, Wausau, archts.

UNCLASSIFIED

PROPOSED WORK

★**California and Nevada**—TRANSMISSION LINE—Southern California Edison Co., 601 W. 5 St., Los Angeles, Calif., 130 mi., 120,000 volt transmission line between Los Angeles, Calif., and Boulder Dam, Nev. $4,500,000.

★**Calif., Seaside**—SHIPYARD DOCKING BASIN, etc.—G. Vellis, 450 Martin St., Monterey and D. Black, 2686 23 Ave., San Francisco, shipyard docking basin and industrial development at Laguna del Rey (The Seaside Lake), involving dredging lake, and old channel to bay permitting small craft to enter land-locked harbor, $1,750,000.

★**Conn., Greenwich** — AIRPORT — North American Airports Corp., c/o Gulf Oil Corp., 17 Battery Pl., New York, N. Y., making plans airport, incl. administration bldg., 3 hangars, several multiple hangar units, concrete aprons, filling stations, control tower, etc. $1,000,000.

Kansas — PIPE LINE — Kansas Power & Light Co., 808 Kansas St., Topeka, 18.05 mi. 4- to 18-in. pipeline, Barber and Pratt Counties.

Minnesota — SERVICE EXTENSIONS — Crow Wing Cooperative Power & Light Co., Brainerd, service extens., in rural electric distr. sys. $25,000. REA allot.

Minnesota — SERVICE EXTENSIONS — Steele-Waseca Cooperative Electric, Owatonna, service extens. in rural electrical distr. sys. $35,000 REA allot.

Minn., St. Cloud—SWIMMING POOL—City, A. J. Haberkorn, clk., outdoor swimming pool, tanks, filters, etc. $25,000. H. V. Feehan, 1004 Marquette Ave., Minneapolis, archt. R. E. Borrowman, city engr.

N. J., Atlantic City—BOARDWALK—City, W. F. Casey, comr. Dpt. P. Wks., bids soon rebuilding boardwalk. $50,000-$75,000. CD 12/11—ENR 12/14.

Texas — TRANSMISSION LINES — Blanco County Electric Cooperative, Blanco, rural electric power transmission lines, Blanco Co. $50,000 REA allot.

Texas — TRANSMISSION LINES — Washington County Electric Cooperative, Brenham, rural electric power transmission lines, Washington Co. $50,000. REA allot.

†**Tex., Texas City**—AIRPORT—Town, imprv. airport, incl. runways, hangar, etc. Over $75,000. CAA.

BIDS ASKED

Bids Asked March 16

†**Connecticut, New Hampshire and Maine**—MARKER FACILITY—Civil Aeronautics Admin., 385 Madison Ave., New York, N. Y., VHF marker facility, incl. fencing site, erecting 8 x 12 type S sectional steel frame bldg., 20 x 40 ft. steel frame counterpoise each site Meriden, Boscawen and East Corinth, Proposal 1-45-515.

Bids Asked March 17

†**Miss., Jackson**—FIRE ALARM SYSTEM—U. S. Eng., Grant St., west of Westwood St., Mobile, exten. automatic fire alarm sys. incl. laundry and hospital expansion, Foster General Hospital, Serial No. 01-076-45-218.

Bids Asked March 21

★†**Mich., Sault Ste. Marie**—PIERS, etc.—U. S. Eng., 700 Union Guardian Bldg., Detroit, constructing Brady Pier, 40x140 ft., cellular structure of steel sheet piles with concrete superstructure, 178x500 ft. mooring basin and 56x61 ft. masonry boathouse. Over $500,000. CD 2/26—ENR 3/1.

Bids Asked

★**Louisiana and Mississippi** — OIL PIPELINE — Oklahoma Pipe Line Co., NE of city, Oklahoma City, Okla., and Standard Oil Co. of Louisiana, 1539 Jackson Ave., New Orleans, La., 121 mi. 8- to 12-in. crude oil pipeline carrier feeder loops from points in lower Mississippi to near Baton Rouge, La. $2,500,000. CD 2/19—ENR 2/22.

†**Mass., Framingham**—FIRE PROTECTION—U. S. Eng., 31 St. James Ave., Boston, (selected bidders) fire protection, No. 19-023-45-NEG-95.

★**Texas and Louisiana** — PIPELINE — United Gas Pipe Line Co., 1525 Fairfield Ave., Shreveport, La., 140 mi. 24 in. steel natural gas pipeline carrier running from Carthage, Tex., and connecting with Tennessee Gas & Transmission Co. main line at Monroe, La. $7,000,000. CD 2/14—ENR 3/1.

LOW BIDDERS

†**Calif., Benicia**—MODIFYING CROSSOVERS, etc.—U. S. Eng., 74 New Montgomery St., San Francisco, modifications crossovers and firewalls at Benicia Arsenal, Jobs 1731 and 1808, from J. A. Bryant, 1815 Capital St., Vallejo, **$48,049.**

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INDUSTRIAL BLDGS. (Low Bidders, Cont'd)

†Calif., El Toro—AIR STATION BLDGS.—**Yards & Docks, Navy Dpt.**, 18 St. and Constitution Ave. N.W., Wash. 25, D. C., Feb. 21, barracks for Women Marines, Marine Corps Air Station, Spec. 15731, NOY 11418, from Allison Honer Co., 103 E. Third St., Santa Ana, **$376,666.** Estimated $158,400. CD 1/4.

†Mass., Lawrence—AIRPORT—Civil Aeronautics Admin., 385 Madison Ave., New York, N. Y., Feb. 28, grading, clearing, drainage, seeding, paving airport, Proposal 1-45-267, from M. De Matteo Constr. Co., 200 Hancock St., Quincy, **$213,137.** CD 2/13—ENR 2/15.

†Tex., Brownsville — INSTRUMENT LANDING SYSTEM—Civil Aeronautics Admin., P. O. Box 1689, Fort Worth, Zone 1, Mar. 1, instrument landing sys. at Municipal Airport, Proposal 4-45-2938, from Schanche Engrg. & Constr. Co., 810 Holland Bldg., St. Louis 1, Mo., **$28,897.** CD 2/13—ENR 2/15.

CONTRACTS AWARDED

†Ala., Camp Rucker—TARGET RANGE—U. S. Eng., Grant St. west of Westwood St., Mobile, one 25 target and one 50 target known distance range, to Williams Constr. Co., 1032 13 St., Columbus, Ga., and Coffee Constr. Co., Eastman, Ga., **$71,680.**

†Ark., Pine Bluff—SPRINKLER SYSTEM—U. S. Eng., 300 Bway., Little Rock, sprinkler sys., at Arsenal, Solic. 03-050-45-46, to Perkins Automatic Sprinkler Co., 417 E. Markham St., Little Rock, **$47,476.**

†Fla., Eglin Field (br. Crestview)—FENCING, etc.—U. S. Eng., Grant St., west of Westwood St., Mobile, Ala., fencing, grassing, addnl. underground magazines, access roads, drainage, to A. Blair, 1209 First Natl. Bank Bldg., Montgomery, Ala., **$97,712.** Bids 2/17.

★ **†Fla., Eglin Field (br. Crestview)**—INSULATION, etc.—U. S. Eng., Grant St., west of Westwood St., Mobile Ala., installing complete insulation and vapor barriers on walls and ceilings for climatic hangar and entrance locks, to Reilly-Benton Co. Inc., 612 Hibernia Bldg., New Orleans, La., **$505,000.** CD 5/19—ENR 5/25.

†Ga., Fort Benning — AUTOMATIC SPRINKLER SYSTEM—U. S. Eng., Grant St. west of Westwood St., Mobile, Ala., automatic sprinkler sys. in laundries, to Automatic Sprinkler Corp. of America, 141 Spring St. N.W., Atlanta, **$29,616.** Bids 12/16. CD 11/28—ENR 11/30.

†Mass., Camp Edwards — SPRINKLER SYSTEM—U. S. Eng., 31 St. James Ave., Boston, sprinkler sys., Spec., 19-022-45-NEG-91, Sect. A, to Rockwood Sprinkler Co., 141 Milk St., Boston, **$56,560;** Sect. B, to Viking Sprinkler Co., Inc., 51 Sleeper St., Boston, **$82,638.** CD 2/26—ENR 3/1.

†New York—FACILITIES—U. S. Eng., 120 Wall St., New York, Zone 5, addnl. facilities, Richmond Co., to Wagner-Larsen Constr. Co., 811 Union St., Brooklyn, Zone 15, **$51,900.** CD 2/2.

†N. Y., Rochester—SPRINKLER SYSTEM—U. S. Eng., 120 Wall St., New York, Zone 5, sprinkler sys., to Globe Automatic Sprinkler Co., 250 Park Ave., New York, Zone 17, **$38,283.**

Okla., Bethany—HANGAR—City, E. Simon, clk., City Hall, new airport hangar at Bethany Field, to Star Mfg. Co., Commerce Exchange Bldg., Oklahoma City, **$30,800.** Est. $35,000. Awarded 2/27.

Ore., Prineville—RAILWAY TIES AND BALLAST—City of Prineville Railways, Prineville, laying new ties and ballast on 19 mi. of railroad, to Morrison-Knudsen Co., 319 Bway., Boise, Idaho. Est. **$50,000.**

R. I., Newport—BATHHOUSES—Hazard Beach Subscribers, J. J. Sullivan, chn., 29 Pelham St., rebuilding 130 bathhouses, Hazard Beach. Owner builds. Est. **$40,000.** CD 1/31.

Texas—TRANSMISSION LINES—Victoria County Electric Cooperative, Victoria, 100 mi. rural electric power transmission lines, to State Electric Co., 1607 Vaughn St., Fort Worth, approx. **$25,000.** Beavers & Lodal, Transit Tower Bldg., San Antonio, engrs. CD 3/1.

†Utah, Dugway (br. Tooele) — TEST STRUCTURES—U. S. Eng., 580 S. State St., Salt Lake City, constructing test structures, at Dugway Proving Grounds, to R. J. Daum, Beason Bldg., Salt Lake City, **$25,662.** Bids 2/16.

†Utah, Ogden—AIR DEPOT BLDGS.—U. S. Eng., 580 S. State St., Salt Lake City, film storage vaults and cold storage room in Bldg. 102 at Ogden Air Depot, to R. J. Daum Const. Co., 613 Beason Bldg., Salt Lake City, **$50,500.** Bids 3/1.

Washington — RAIL REPLACEMENT—Northern Pacific Ry. Co., B. Blum, ch. engr., 176 E. 5 St., St. Paul, Minn., replacing 90-lb. rail with 112-lb. rail on 9 mi. stretch from Ritzville to Paha, with grade imprv. and ballast, day labor, **$90,000.**

Wash., Longview—FIRE ALARM SYSTEM—City, City Hall, installing fire alarm sys., to Leon Hampton Co., 1351 Vandercook Way, **$26,250.** W. J. Alsdorf, 152 W. 60 St., Seattle, Zone 7, engr. Bids 2/15. CD 12/31—ENR 1/4.

Wash., Olympia—TRANSIT SHED, etc.—Port of Olympia, Olympia, transit shed and office bldg., to A. G. Homann, 112 N. Franklin St., **$122,550.** CD 2/9—ENR 11/14.

Proposal Advertisements see p. 237
Postwar Projects see p. 170